Engineering

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BIBLIOGRAPHY OF Technical Reports

February 13, 1953 Vol. 19, No. 2

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

Control of grasshoppers over a large area by treatment with chlordane solution sprayed from aircraft, by E. A. Perren. Canada. Defense Research Board. Experimental Station, Suffield, Alberta. Jul 1950. 20p photo, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108213

A Canadian experiment is reported on the effect as a grasshopper insecticide of a chlordane solution sprayed from an airplane. The grasshopper population varied from 2 to 15 per sq yd, with an approximate average of 4 per sq yd. The predominant species was the lesser migratory locust Melanoplus m. mexicanus, of which approx 75% were in the adult stage. The spray apparatus consisted of a straight emission pipe fed by gravity from two 280-gal tanks at the flow rate of 3-1/2 gal per sec. With deposit densities of chlordane varying up to approx 3 lb/acre and averaging 0.63 lb/acre, 70 to 95% control of grasshoppers was obtained within 72 hr of the treatment. The high expenditure of approx 1.3 lb of chlordane to produce an average deposit density of 0.6 lb/acre is criticized, and it is suggested that the spray apparatus be improved to achieve more economic results. Suffield report no. 167.

Effect of stress on the metabolism of ascorbic acid. I: Increased excretion of dehydroascorbic and diketogulonic acids by rats exposed to cold, by Mary Mills Monler and Roslyn J. Weiss. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1952. 7p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107896

Rats excrete nearly three times as much dehydroascorbic acid at 0° C. as they excrete at 21° C. and six times as much diketogulonic acid. An increase in excretion of ascorbic acid is also observed in rats kept in a cold environment, but the magnitude of the change is not so striking as that of oxidized forms. All of these changes in ascorbic, dehydroascorbic, and diketogulonic acids observed when rats are exposed to cold are statistically highly significant. AAF SAM Proj no. 21-1208-0001, Report no. 1.

Improvements in the field distillation of peppermint oil, by A. D. Hughes. Oregon. Engineering Experiment Station, Corvallis, Ore. Aug 1952. 65p photos, drawings, graphs, tables Available from Oregon State Engineering Experiment Station, Corvallis, Ore. $.60. PB 108149

1. Peppermint oil - Distillation 2. Distillation plants - Equipment 3. O EES B31.

Reports on drugs and pharmaceuticals. Boehringer, C. F., & Söhne, Mannheim, Germany. 1934-1944. 509f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $67.50. PB 74411

This FIAT microfilm reel contains reports chiefly on various phases of the production of pharmaceuticals and on research in this field; also statistical data, correspondence, and abstracts of lectures. Individual items, consisting of single reports or groups of related reports, are available as enlargement prints. Please give PB and frame numbers when ordering individual items. They are all in German. A list of titles and subject matter follow. FIAT Reel G 276.

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385-387	3-Methyl-coumarin. 1937.	1.50
388-480	Papers on the oxidation of cholesterol and preparation of testosterone derivatives. 1939-1941.	13.75
481-507	Slips containing statistical information on materials used for production of tablets, etc. n.d.	5.00
508-509	Table showing the assignments of employees to various departments. n.d.	1.50

Agricultural Chemicals

Kali-Chemie, Rhenania Phosphat Werke, Brunsbüttelkoog: Report to Maj. V. Ignatieff, no. 22i/4. CIOS CAFT summary, by J. R. Hawes and F. M. Lea. Aug 1945. If Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $1.25. PB 18913s

Page 4 only. TP 200/98.
1. BIOS FR 94 supplement.

Plastics and Plasticizers

Services, facilities and materials required for investigations and studies on synthetic resinous materials. Polaroid Corporation, Research Dept., Cambridge, Mass. under Contract DA36-039-sc-13. Project RC-18. Dept. of the Army project 3-93-00-500. Signal Corps project 32-2005-33.

Trimonthly progress report no. 4 (period Jun 1-Sep 1, 1950), by S. G. Cohen and M. S. Simon. Sep 1950. 37p graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108164

1. Resins, Casting - Preparation 2. Resins, Synthetic - Electrical properties 3. Styrene, ω-Trifluoromethyl - Preparation 4. Polymerization - Acceleration - Research.

Trimonthly progress report no. 5 (period Sep 1-Dec 1, 1950), by S. G. Cohen and M. S. Simon. Dec 1950. 33p fold tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108165

1. Resins, Casting - Preparation 2. Resins, Casting - Tests 3. Resins, Synthetic - Preparation 4. Copolymers - Preparation.

Trimonthly progress report no. 7 (period Mar 1-Jun 1, 1951), by M. S. Simon. Jun 1951. 43p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108167

1. Resins, Casting - Preparation 2. Resin C 3. Butadiene - Polymerization 4. Resins, Synthetic - Casting 5. Resins, Synthetic - Electrical properties

Trimonthly progress report no. 8 (period Jun 1-Aug 31, 1951), by M. S. Simon. Aug 1951. 33p graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108168

1. Resins, Casting - Preparation 2. Butadiene - Polymerization 3. Phillips polybutadiene (Trade name) 4. Resins, Synthetic - Electrical properties

Ultra-high frequency high temperature dielectric materials. Trimonthly progress report no. 7, period Dec 1, 1949-Feb 28, 1950, under Contract W36-039-sc-38105, by H. T. Wolosinski and S. G. Cohen. Polaroid Corp. Research Dept., Cambridge, Mass. Mar 1950. 28p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107572

Project RC-7. Dept. of the Army report 3-93-00-500. Signal Corps project 2005. Includes reprint from Journal of the American Chemical Society vol. 71 (1939) p. 3439-3440: α,β,β-Trifluorostyrene and α-chloro-β,β-difluorostyrene, by Saul G. Cohen, Henry T. Wolosinski, and Paul J. Scheuer.
1. Styrene,α,β,β-Trifluoro - Preparation 2. Styrene,α-Chloro-β,β-difluoro - Preparation 3. Ethylene, Tetrafluoro - Polymerization 4. Styrene,α,β,β-Trifluoro - Polymerization 5. Dielectric research 6. Plastics - Dielectric properties

Paints, Varnishes and Lacquers

Fungicides for use in paints. U. S. Army. Corps of Engineers. Engineer Research and Development Laboratories, Fort Belvoir, Va. Project 8-91-02-001. ERDL R 1118.

Part I: Test methods for evaluating paint fungicides, by Richard E. Vicklund and Milton Manowitz. Apr 1949. 28p photos, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111061

This report covers an investigation of the problems involved in determining the mildew resistance of coating materials such as paints, varnishes, and lacquers; and the selection or development of a test method for evaluating compounds as paint fungicides.

Part II: Evaluation of paint fungicides, by Richard E. Vicklund and Milton Manowitz. Jul 1949. 26p photos, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111062

This part of the report covers an investigation conducted to evaluate the fungicidal properties of various compounds to determine their potentialities as fungicides for use in paints, varnishes, and lacquers.

Chemical Engineering and Equipment

Methods of sulphur recovery in Germany and some related points concerning the problem of sulphur shortage in the United Kingdom. Gt. Brit. Dept. of Scientific and Industrial Research. Technical Information and Documents Unit, London, England. n.d. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107944

Includes bibliography of documents of general interest concerning production and recovery of sulphur. Supplement. 8p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
1. Sulfur - Recovery 2. Sulfur - Production - Germany 3. Sulfur - Bibliography - Germany.

Report of the Chemistry Research Board, with the Director of the Chemical Research Laboratory for the year 1951. Gt. Brit. Dept. of Scientific and Industrial Research. Chemistry Research Laboratory, Teddington, Eng. 1952. 135p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 108131

S. O. code no. 47-103-0-51.
1. Chemical research - Gt. Brit. 2. Laboratories, Chemical - Gt. Brit.

Thin films, a symposium sponsored by the Chemistry Division, A.E.R.E., Harwell, held at Buckland House, 14th-15th March 1951, an A.E.R.E. report edited by F. Hudswell and C. J. Mandleberg. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 51p photos, diagrs, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 107963

HD. 642. Contents: 1. Introductory remarks, by R. Spence. - 2. Uses and characteristics of thin films, by E. Bretscher. - 3. Adhesion and stability of films, by F. Hudswell. - 4. Methods available for the preparation of thin films, by F. Hudswell. - 5. Vacuum coating by sputtering and thermal evaporation, by T.A.J. Jaques. - 6. Sublimation technique for the preparation of thin films of plutonium, by J. K. Dawson. - 7. Painting technique for the preparation of films, by W. J. Whitehouse. - 8. Electromagnetic separator as a means of preparing thin films, by W. D. Allen. - 9. Preparation of films for electron analysis, C. S. Lees. - 10. Electrodeposited films, by O. Flint. - 11. Aluminum oxide films, by A. Charlesby. - 12. Preparation of

films for α-counting, by C. J. Mandleberg. - 13. General discussion.
1. Atomic power - Research - Gt. Brit. 2. Films, Thin - Gt. Brit. 3. Films, Plutonium - Preparation - Gt. Brit. 4. Films, Electrodeposited - Gt. Brit. 5. AERE C/R 861.

Miscellaneous Chemicals

Bonds in diatomic molecules, by Howard Reiss and Herbert Glazer. Boston University. Dept. of Chemistry, Boston, Mass. Progress report no. 5 under Contract no. AF 19(122)-450. Aug 1952. 12p Available from Library Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107984

1. Molecular structures 2. Electron diffraction patterns 3. Iodine chloride 4. Nitrogen oxides.

Catalytic synthesis of hydrazine from ammonia. Battelle Memorial Institute, Columbus, O. Sixth bimonthly progress report under Contract no. AF-33(039)-2130 from Jun 15, 1950 to Aug 15, 1950, by J. N. Pattison, T. J. Hanratty, G. F. Sachsel, J. E. Yocom, R. Q. Wilson, J. J. Ward, and J. W. Clegg. Oct 1950. 54p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108090

Progress made on the catalytic synthesis of hydrazine from ammonia is reported. Several runs made with the adsorption apparatus are described, and the results are discussed. One of the best hydrazine synthesis catalysts discovered in the early screening tests, Filtrol X-358-C, was studied by both nitrogen and ammonia adsorption. A number of catalysts prepared without the use of inert carriers were tested for hydrazine decomposition in a Pyrex reactor. Bare traces of hydrazine were formed with bronze as a catalyst, although it decomposed less hydrazine than any other metal tested. Earlier work showed that the addition of water vapor decreased hydrazine decomposition. Little, if any, improvement resulted when water vapor was added to the feed in a synthesis run to determine if the conversion could be increased.

Catalytic vapor-phase oxidation of some four-carbon hydrocarbons, by Randolph H. Bretton. Yale University. Chemical Engineering Dept., New Haven, Conn. 1949. 344p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $43.75. PB 107750

The vapor-phase oxidation of isobutylene, 1-butene, 2-butene, and butadiene over silver, silver-oxide and vanadium-pentoxide catalysts was investigated. The variables studied were contact time, air-hydrocarbon ratio and temperature. Theories on the mechanism of hydrocarbon oxidation and catalytic vapor-phase processes are discussed, and the construction and operation of the experimental apparatus are outlined. Flowmeter calibration, catalyst preparation, experimental procedure, and results are presented for each experiment. A mechanism for the oxidation of hydrocarbons over a vanadium-pentoxide catalyst is proposed which involves a series of atomic dehydrogenations with simultaneous formation and resultant decomposition of peroxides. Thesis-Yale University. Investigation undertaken in Jun 1946 as part of Navy Task order VIII under Contract N6ori-44.

A collection of chemical reports. I. G. Farbenindustrie A. G. 1943. 351f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $47.50. PB 74809

This reel contains miscellaneous reports in the fields of chemistry and chemical technology. Individual items, consisting of single reports or groups of related reports, are listed below; they are available separately as enlargement prints. Please give PB and frame numbers when ordering individual items. All reports are in German. FIAT Reel O 228.

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3998-4001	Production of dicyclohexylamine. 1943. Not very legible.	1.50
4002-4018	Packed columns. 1942.	3.75
4019-4028	Polymerization experiences in the production of Buna S. 1944.	2.50
4029-4041A	Studies on indigo. 1938.	3.75
4042-4052	Analytical methods. 1941-1942.	3.75
4053-4085	Reports on bleaching earths and the amorphous alumina gel "Teg." 1942-1943.	6.25
4086-4329C	The "HF" plant. 1940-1944. "HF" is explained as "hydroforming," a hydrogenation process, by which high-grade motor fuels and lubricants were produced. Descriptions of the processes, production of the necessary catalysts, flow diagrams, etc., have been combined here.	32.50

Correspondence, minutes and notes relating to hydrogen peroxide production and plant at Heydebreck. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. May 1943-Oct 1944. 21f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Enlargement Print $5.00. PB 107717

English abstract included. Abstract is also available as PB 107717s. 1p Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $1.25, Photostat $1.25.
1. Hydrogen peroxide - Production - Germany 2. Renal - Germany 3. Solvents - Production - Germany 4. I. G. Farbenindustrie A. G. - Plants - Germany 5. Micro BIOS FD 601/48, Frames 1-21.

Determination by radioactivation of arsenic occurring in high purity sulphur used by Isotopes Division, an A.E.R.E. memorandum, by L. Salmon. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 4p table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107961

S. O. code no. 70-674-0-81.
1. Atomic power - Research - Gt. Brit. 2. Arsenic - Determination - Gt. Brit. 3. Arsenic - Radioactivity - Gt. Brit. 4. Sulfur - Analysis - Gt. Brit. 5. AERE C/M 154.

Electrolytic reduction of simple nitrate esters, by Frederick Kaufman, Helen J. Cook, Stanley M. Davis. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jan 1952. 19p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108257

The polarography and large scale reduction of ethyl- and cyclohexyl-nitrate were studied. Between pH 3 and 13 a pH independent reduction wave was obtained and the reduction found to be diffusion controlled but irreversible. A two electron mechanism with alcohol and nitrite ion as reduction products was established and found to be consistent with all observations. The catalytic reduction in the presence of Ce^{+++}, La^{+++}, and UO_2^{++} was studied and conclusions are **drawn** regarding the catalytic reduction of NO_2^-. **Project** no. TB3-0110. APG BRL M573.

Production of iodine 131 from pile irradiated tellurium at about the curie level of activity, an A.E.R.E. report, by W. J. Arrol. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Sep 1951. 4p drawing Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107969

S. O. code no. 70-674-0-40. HD. 556.
1. Atomic power - Research - Gt. Brit. 2. Tellurium - Irradiation - Gt. Brit. 3. Radioiodine - Production - Gt. Brit. 4. Radioiodine - Production - Equipment - Gt. Brit. 5. AERE I/R 777.

ELECTRICAL MACHINERY

Communication Equipment

Instruction book for Navy model RBZ radio receiving equipment frequency range 5-13-MC manufactured for U. S. Navy Dept. Bureau of Ships. Supplement. Emerson Radio & Phonograph Corp., New York, N. Y. Mar 1945. 80p photos, diagrs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 107977

Contract no. NXss-15891. This supplement will remain in effect only until the information is published in an official War Department publication.
1. Radio receivers - Operation 2. RBZ (Radio receiving equipment) 3. U. S. Bureau of Ships 4. WD TM 11-895.

Microwave research. Duke University. Dept. of Physics, Durham, N. C. Quarterly progress report, Mar 1-Jun 30, 1952, under Contract no. AF 19 (604)-258, by Walter Gordy. 1952. 54p diagr, graphs, tables Available from Library of Congress Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108012

Includes special reports: Line-breadths of the microwave spectrum of oxygen, by Roy S. Anderson, William V. Smith and Walter Gordy. - On the Stark effect of the asymmetric rotator with hyperfine-structure, by Masataka Mizushima Errata: Microwave spectrum and molecular constants of hydrogen cyanide, by James W. Simmons, Wallace E. Anderson and Walter Gordy (published in Phys. rev. 77, p. 77, 1950).
1. Radio waves - Absorption 2. Radio waves - Research 3. Oxygen - Spectrographic analysis 4. Molecular theory 5. Stark effect.

Progress report, series no. 1, issue no. 57, 1 Mar 1952-30 Jun 1952, prepared by Daniel H. Goodman under Contract nos. W33-038-ac-16649 and W-19-122-ac-38. California. University. Institute of Engineering Research. Microwave Laboratory, Berkeley, Calif. Aug 1952. 13p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108011

1. Resnatrons 2. Radio waves - Research 3. Cathodes, Hot - Research 4. Furnaces, Vacuum - Design.

Radio observations of the sun, by A. Edward Lilley. Harvard University. Harvard College Observatory. Solar Dept. Sep 1952. 30p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108229

This report presents a summary of the observations of solar radio noise from 1 centimeter to approximately 12 meters. Other observations, from 12 to nearly 50 meters are also reported, but they are generally few and, because of poor resolution and ionospheric disturbances, usually inconclusive. Observations that have been reported since 1950 are treated in more detail than those preceding, because summaries of material to this data have been published. No attempt has been made to collect the instrumental techniques that have been devised to re-

cord the radiation. A considerable number of papers have appeared which give theoretical discussion of solar microwave noise and its propagation. Both of these subjects form material for additional papers and a summary of the late work is certainly needed. Contract AF19 (604)-146. HU HCO SR4.

Sky-wave field intensity. I: Low and very low radio frequencies, by J. A. Pierce. Harvard University. Cruft Laboratory. Sep 1952. 171p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.50, Photostat $22.50 PB 108074

Contract N5ORI-76, Task order nos. 28 & 45, NR-071-011.
1. Radio waves - Transmission - Theory 2. Radio waves - Transmission - Measurements 3. Radio frequencies, Low voltage 4. Radio fields - Intensity 5. HU CL TR 158.

Electronics

Back-scattering of electromagnetic waves from spheres and spherical shells, by A. L. Aden. U. S. Air Force. Cambridge Research Center. Geophysics Research Division, Cambridge, Mass. Jul 1952. 42p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107899

The classical theory of the scattering of a plane electromagnetic wave by a sphere is reviewed, and the difficulties in getting numerical answers from this formal solution are discussed. Theoretical results are compared with those obtained experimentally. A rigorous solution is also given for the scattering of a plane electromagnetic wave from two concentric spheres of different dielectric constant. The application to a particular physical problem is indicated. AAF GRD P 15.

Basic investigations of the possibilities to advance into the submillimeter region. Illinois. Engineering Experiment Station. Electrical Engineering Research Laboratory. Electron Tube Research Section. Interim engineering report no. 4 on Contract no. AF 18 (600)-23 for the period 1 May 1952 to 1 Aug 1952. Sep 1952. 102p photos, fold drawing, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 107722

Contents: I. Introduction. II. Submillimeter wave generation by accelerated electrons, by P. D. Coleman, I. Kaufman, M. D. Sirkis, S. H. Vegors. - III. High level pulser, by K. R. Brunn and E. W. Ernst. - IV. Transmission-line tubes, by V. J. Fowler. - V. Loss measurement of ceramic to metal seals, by E. W. Ernst and O. T. Purl. - VI. Gaseous electronics. Part 1. Gas discharge plasma, by J. E. Etter. Part 2. Ferromagnetic dielectrics (ferrites) by M. Gilden. Part 3. Experiments on high density plasmas produced by high energy particles, by W. H. Christoffers. Part 4. Plasma oscillations, by C. L. Coates. - Part 5. Fundamental studies in gaseous discharges using microwave techniques, by C. L. Coates. - VII. The rotatron, by G. L. Clark, H. von Foerster, L. R. Bloom. - VIII. Aspects of the use of the IBM card-punch calculator on an integral equation and the possible use of an electronic digital computer, by Frank L. Jenkins.
1. Plasma, Electron - Oscillations 2. Adhesives - Ceramic to metal 3. Seals - Vacuum properties 4. Electrons - Acceleration 5. Helix 6. Doppler effect 7. Rotatron 8. Radio waves - Propagation

Bi-monthly progress report. Pennsylvania University, Philadelphia, Pa. Under contract NObsr-42487.

Mar 1 to Apr 30, 1950, by P. H. Miller, Jr. Jun 1950. 22p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108001

Work on the following was continued: (1) study of the work function of semiconductors, (2) investigation of the electrical conductivity of semiconductors, (3) studies of the Hall Effect as a function of temperature, (4) theoretical and experimental explorations of the phenomena underlying the noise spectrum of metal semiconductor contacts, (5) investigation of the nature of lattice defects in semiconductors, (6) study of the photoconductivity of semiconductors at low temperatures, and (7) detailed study of the conductivity of Se doped with metals and nonmetals.

Nov 1 to Dec 31, 1949, by P. H. Miller, Jr. Feb 1950. 15p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107994

Broad-band axially symmetric vertex feed, by F. L. Hennessey. U. S. Naval Research Laboratory. Oct 1952. 15p photos, drawings, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111079

A new vertex feed for microwave reflectors employing a splash plate of special geometry is described. A straight section of circular waveguide extends through the vertex of a paraboloid reflector and is terminated at the focus by a splash plate which directs the radiation back onto the reflector. The advantages of this feed over vertex feeds presently in use are a broad-frequency bandwidth (VSWR < 1.4 over a $\pm 15\%$ band without matching devices) and an axial symmetry that permits the use of circular, linear, or elliptical polarization. An analagous feed out of rectangular waveguide is also described. NRL R4071.

Capacitor development. General Electric Co. Capacitor Engineering Division, Pittsfield, Mass. Final report under Contract no. W36-039-sc-32252, by L. W. Foster. n.d. 37p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington

25, D. C. Microfilm $2.25, Photostat $5.00.
PB 107812

1. Capacitors, Electrolytic.

Cathode-ray tubes, cathode-ray oscillographs and other apparatus. Allgemeine Elektricitaets-Gesellschaft, Berlin. 1939-1946. 115f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Enlargement Print $16.25. PB 82183

This FIAT microfilm reel consists of drawings and parts lists of electrical and other instruments as listed below. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $4.75. Please include PB and frame numbers when ordering individual items from this microfilm reel. In German. FIAT Reel GG 48.

Frames	Title	Price
241-277	Various types of cathode-ray tubes. 1940-1946. Drawings.	$6.25
278-282	Two-beam cathode-ray oscillograph EO 2-160-88N. 1945. Parts list and drawings.	1.50
283-286	Miniature oscillograph ED1-60-5N. 1943. Parts list and drawings. Indistinct.	1.50
287-290	Contact feeler, Geatest type. 1943. Parts list and drawings.	1.50
291-293	Varnish hardness tester. 1943. Parts list and drawings.	1.50
294-294C	Spring tester. 1939. Parts list and drawings	1.50
295-298	Magnet tester. 1942. Parts list and drawings.	1.50
299	Stand for magnifying glass. n.d. Drawing.	1.50

High dielectric constant high temperature ceramic suppression capacitor. Stupakoff Ceramic & Manufacturing Co., Latrobe, Pa. First quarterly progress report (Report np. 3) under Contract no. W36-039-sc-38251, period 1 Apr to 30 Jun 1949, by R. E. Stark. Jul 1949. 15p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107989

The following report covers work on the above contract during the first quarterly period comprising the months of April, May and June. The work during this period was concerned chiefly with setting up the program for improving the electrical properties of the material at elevated temperature. This is the first phase of investigation called for under the contract. In addition, the additional purchased test equipment required for the insertion loss measurements in the second phase were ordered and received just prior to the close of the period. These are the Measurements Corporation, model 80 signal generator, the Hammarlund HQ 129 Receiver and National HFS Receiver (which is to be used as a converter in conjunction with the HQ 129 for frequencies above 30 mc.

Services, facilities, and material for research and development leading toward improved or new designs of glass dielectric capacitors. Corning Glass Works, Corning, N. Y. Third quarterly progress report under Contract no. W36-039-sc-38227, period Aug 1-Oct 31, 1949, by G. P. Smith. Nov 1949. 16p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 107988

The work performed under this contract during its third quarter is described. Results of vibration-humidity tests at Squier Laboratory are given; no reason for the failure of glass capacitors in these tests is advanced at this date. Dielectric strength and life tests made on capacitors of diverse sizes and construction in order to determine maximum ratings are described with the results to date. Construction of equipment for making shaped cover of closely held dimensions is proposed. Other work indicated for the next interval is outlined, and a list of the personnel, and the time spent on this program is appended.

Shipboard anti-submarine sonar trainer (Sasat A, model V), by Edward J. Smuckler. California. University. Division of War Research. May 1944. 24p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75.
PB 107779

Contract OEMsr-30.
1. Sonar - Training devices 2. Sasat A (Sonar trainer) 3. Anti-submarine devices 4. U. S. Navy Radio and Sound Laboratory, San Diego, Calif. 5. UC DWR U211 6. NDRC 6.1-1511 7. OSRD 3794.

Side-lobe conference. U. S. Naval Research Laboratory. Apr 1952. 44p photos, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25.
PB 111076

The origin of the side lobes might be considered the subject of most of the papers published in this report. Two of the papers consider the general problem of relating the pattern characteristics, one of which is side-lobe level, to the aperture illumination. Two other papers consider the effect on the pattern of mechanical errors in the paraboloid reflector which is used as the focusing objective. The remaining paper describes a method of reducing the side lobes caused by diffraction. All of these papers provided definite contributions toward solution of the side-lobe problem; it is evident that further work will be done in evaluating particular aperture distributions and in developing methods of side-lobe suppression. Contents: Method of side-lobe reduction, by Carlyle J.

Sletten and William G. Mavroides. - Effect of aperture distribution errors on radiation pattern, by John Ruze. - Antenna pattern calculation for asymmetrical aperture distributions, by Charles C. Allen. - Effects of mechanical derivations in radar antenna reflectors, by John F. Dominy. - Antenna pattern synthesis method, by T. T. Taylor. NRL R 4043.

Sound field of echo-ranging gear. California. University. Division of War Research. Interim report under Contract OEMsr-30. Oct 1943. 53p photo, diagrs, graphs (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107856

1. Sound, Underwater - Transmission 2. Sound, Underwater - Transmission - Research 3. Sonar - Echo ranging systems 4. U. S. Navy Radio and Sound Laboratory, San Diego, Calif. 5. NDRC 6.1-516 6. UC DWR U113 7. OSRD 2011.

Study of automatic printed circuit techniques. Balco Research Laboratories, Newark, N. J. Fifth quarterly report for period ending 1 Oct 1949 under Contract no. W-36-039-sc-38146, by Lewis Balamuth and M. U. Cohen. Oct 1949. 26p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108003

Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 2006. For final report see PB 107405.
1. Circuits, Electronic - Printed 2. Circuits, Electronic - Miniaturization 3. Transceivers, Miniature - Design 4. Transceivers, Miniature - Production.

Telephony. Variable resistors. Ministerial Documents Branch, Berlin. 1919-1944. 724f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $95.00. PB 84223

This FIAT microfilm reel consists of publications on telephony, telephone stations and variable resistors as listed below. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $9.00. Please include PB and frame numbers when ordering individual items from this microfilm reel. In German. FIAT Microfilm Reel B229.

Frames	Title	Price
9884-9910	Fundamentals of large telephone network construction, by J. Nagel. 1941-1942. Reprint from the "Jahrbuch des elektrischen Meldewesens."	$5.00
9911-9945	Twenty-five years of variable Preh resistors, by "Preh"-Elektrische Werke, Bad Neustadt-Saale. 1919-1944.	6.25
9946-9999	European telephone service, vol. 54, Mar 1940 and vol. 57, Apr 1941. Edited by P. H. Craemer.	8.75
78-519	Communications from the main German post office. Vols. XX, XXI and XXII, 1938-1941. Publisher: Julius Springer, Berlin.	$58.75
520-607	Communications of the research institute of the German post office. Vols. I and II, 1937 and 1938.	12.50

Trionode, a versatile gas tube. Northrop Aircraft, Inc., Hawthorne, Calif. n.d. 13p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108037

Information and technical data are presented on the development and application of the new trionode tubes. These tubes have shown such characteristics as to be of interest in many fields of electronics. Trionodes are used in pulse generating, gating, pulse counting, and pulse amplification. In flip-flop and counting circuits one trinode replaces two conventional gas triodes or one duel triode vacuum tube. The trionode is exceptionally rugged because it has no delicate grids, no close spacing of electrodes, and no close tolerances of dimensions. The inherent reliability of the trionode is enhanced by the fact that, because of its cold cathode design, tube life can be predicted accurately, thus reducing the likelihood of failure during operation.

Generators, Motors, Transmission

Experiments with an electrically heated wire in a liquid, by M.F.M. Osborne. U. S. Naval Research Laboratory. Aug 1945. 25p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107868

The properties of an electrically heated wire in various liquids have been investigated in an effort to explain qualitatively the properties of the hot-wire sound generator. The sound from the hot wire is primarily a cavitation noise - its properties can all be ascribed to the continuous formation and collapse of vapor cavities. Many of the phenomena of cavitation have a counterpart in boiling. It is shown that under certain conditions the hot wire has two stable forms of operation for the same input power. In one the wire is relatively cold and the sound emitted has a broad frequency distribution. In the other the wire is red hot and the sound emitted is a single pure tone. NRL S 2599.

Handbook, maintenance instructions: Signal generator TS-452B/U. U. S. Air Force. Dec 1951. 50p photos, diagrs, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107744

Basic issue.

1. Generators, Signal - Maintenance and repair 2. TS-452B/U (Signal generator) 3. AAF TO 16-35TS452-7.

Parts catalog: Signal generator TS-452B/U (Lewyt Co.) U. S. Air Force. Oct 1951. 46p drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107745

Basic issue.
1. Generators, Signal - Parts 2. TS-452B/U (Signal generator) 3. AAF TO 16-35TS452-8.

Miscellaneous

Analysis of magnetron oscillations at low magnetic and electric fields, by John W. Moll. Ohio State University Research Foundation, Columbus, Ohio. Jun 1952. 114p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108026

Research was undertaken to investigate the possibility of operating a multicavity magnetron at values of electrical and magnetic field near the characteristic values. This would make possible the scaling of the magnetron to very short wavelengths before encountering difficulties with anode heating and magnetic field limitations. The essential change in design for low field operation is the use of a small cathode diameter. An account is given of a familiar theoretical concept of ordinary magnetron operation and this is related to the operation at low fields. Electron trajectories are calculated for low field conditions. The theoretical concept of low field operation is in general agreement with experimental results obtained at this laboratory. Experimental results are given for an 18 segment anode. It is essential that a sharp cut-off curve be obtained to allow for low field oscillations. The violation of the Hull cut-off relation at high voltage places a limitation on the voltage at which it is possible to design low field magnetrons. Contract no. W33-038-ac-15162. RDO no. R-111-51. Originally presented as a dissertation. AAF WADC TR 52-171.

Batteries for signal communication except those pertaining to aircraft. Changes no. 1. U. S. War Dept. Jul 1944. 36p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107976s

Supersedes TB Sig 6, 22 Jan 1944 and TB Sig 14, 8 March 1944. Supplement to PB 107976.
1. WD TM 11-430, Change no. 1 2. AAF TO 16-1-134, Change no. 1.

Block simplification and improvement. Radio Corporation of America. RCA Victor Division, Camden, N. J. Final report, period Jun 22, 1942 to Oct 31, 1945, under Contract OEMsr-441, by W. J. Poch and A. H. Turner. Nov 1945. 15p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107838

Early flight tests of Block 1 equipment indicated that satisfactory performance under the conditions of actual operation in military aircraft imposed extremely severe requirements on the operating characteristics of the equipment. NDRC 5.3. OSRD 6395.

Block 18 television equipment. General Electric Co., Schenectady, N. Y. Final report under Contract OEMsr-1172, by H. B. Fancher. Dec 1944. 129p photos, fold drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 107861

The FM System developed produced good signals under all conditions, both plane to plane and plane to ground, as long as limiting action was obtained at the receiver. Poor range and large variations in range with frequency resulted apparantly from distortion of the antenna pattern by the airplane and improper matching of the receiver to its antenna. Drawings will not reproduce well. Includes Final construction specification RA 2949, television relay link. OSRD 4670.

Emission life of oxide cathode tubes, by P. A. Redhead and L. R. McNarry. National Research Council of Canada. Radio and Electrical Engineering Division. Jun 1952. 26p photos, graphs, tables Available from National Research Council of Canada, Ottawa, Canada $.50. PB 108039

A review of the causes of emission failure of oxide cathode tubes is presented. Part I discusses those parameters affecting tube life which are controllable, to some degree, by the circuit designer. Part II considers those parameters which are controllable only during the design and manufacture of the tube. NRCC 2783. NRCC ERA 229.

Experimental investigation of the single-wire transmission line, by T. E. Roberts, Jr. Harvard University. Cruft Laboratory. Feb 1952. 66p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108025

Contract N5ori-76, Task order no. I, NR-078-011.
1. Transmission lines - Theory 2. Currents, Electric - Measurements 3. Currents, Electric - Measuring equipment 4. Coaxial lines - Theory 5. Waves, Electric - Bends 6. HU CL TR 139.

Internally heated storage batteries, by Paul S. Amber U. S. Detroit Arsenal. Components Laboratories, Center Line, Mich. Mar 1951. 15p photos, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108116

An investigation is reported which was made to determine power requirements for the internal heat-

ing of storage batteries. It was found that the internal temperature of a battery can be raised from -65° to +30°F in 45-90 min by using internal heating elements energized by vehicle engine generators, and that increasing the output capacity of vehicle generators permits a reduction of warm-up time. Internal battery heating requires less than 40% of the power that is required by an external battery heating system. It is concluded that internal heating is an effective means of raising the temperature of storage batteries for arctic operation. The rate of temperature rise depends upon the amount of power available for heating purposes. Report no. 699.

Magnesium dry cell construction, by R. C. Kirk, P. F. George and A. B. Fry. Dow Chemical Co., Magnesium Laboratories, Midland, Mich. Revised. May 1951. 17p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108038

The purpose of the report is to describe cell components and assembly methods best suited to the present state of the magnesium dry cell art. In a continuing development such as this, there is not certainty that the particular formulation or method which works best today will be the best a year from today. The principal items covered include: anodes, electrolytes, cathodes, separators, initial voltage lowering, packaging and sealing, pack batteries and spot welding.

Properties of a single-wire line, by T. E. Roberts, Jr. Harvard University. Cruft Laboratory. Nov 1951. 41p graphs, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108024

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Transmission lines - Theory 2. Radiation - Fields 3. Coaxial lines - Theory 4. HU CL TR 134.

Radiation sources for the vacuum ultraviolet. Baird Associates, Inc., Cambridge, Mass. Progress report no. 6 under Contract no. AF 19 (122)-432, covering the period Apr 1 to Jun 30, 1952, by R. O'B. Carpenter. Jul 1952. 15p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107939

The Lyman vacuum ultraviolet spectrograph has been in operation during this contract period. A number of spectra have been obtained with the large hot cathode discharge lamps and with the electrodeless lamps. In each case the intensity of xenon 1470 radiation was roughly determined when the xenon was diluted with various amounts of krypton, argon, neon, and helium, and under various total pressures and electrical power conditions. These experiments were only preliminary and the photographic plate method has not been developed to high accuracy in intensity measurement, but the following conclusions have been established. For a given total pressure, pure xenon is best, dilution with other rare gas always decreasing intensity. Maximum intensity is obtained at the lowest pressure of pure xenon which will sustain the discharge. Inconclusive experiments showed no evidence that a strong magnetic field increases the intensity of the electrodeless discharge. The Philips L-cathode behaved well in the first lamp in which it tried. Pages numbered 102-116. J. O. 5068.

Single conductor connector for replacement of bare soldered joints. Cinch Manufacturing Corporation, Chicago, Ill. Final engineering report under Contract no. AF 33(038)-3494, prepared by William H. McKee. Aug 1952. 17p drawings (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107978

1. Connectors, Electric - Design.

Storage batteries for signal communication except those pertaining to aircraft. U. S. War Dept. Jan 1942. 42p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107976

Supersedes TR 1190-5, May 6, 1931, including change no. 1, Jan 2, 1932.
1. Batteries, Storage - Operation 2. Batteries, Storage - Maintenance and repair 3. Batteries, Storage - Shipment 4. Communications - Equipment 5. WD TM 11-430 6. AAF TO 16-1-134.

Trial and evaluation of trailing antenna modification on North Star aircraft, by B. G. Kuhn. Canada. Royal Canadian Air Force. Central Experimental and Proving Establishment, Rockcliffe, Canada. Oct 1952. 22p photos, drawings, diagr Available from Library of Congress, Publication Board, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108097

1. Antennas, Trailing - Design - Canada 2. RCAF EPE 969.

FOOD AND KINDRED PRODUCTS

Annotated bibliography of subtilin: assay, microbiological production, pruification and chemistry, bacteriology, pharmacology, therapeutic activity, food preservation, and related compounds, by J. C. Lewis. U. S. Bureau of Agricultural and Industrial Chemistry. Western Regional Research Laboratory, Albany, Calif. Revised. Aug 1952. 20p Available from Western Regional Research Laboratory, Albany 6, Calif. PB 108101

1. Bacillus subtilis - Bibliography 2. Subtilin - Bibliography 3. AIC-168.

Determination of pectic substances and pectic enzymes in citrus and tomato products, by R. J. McColloch. U. S. Bureau of Agricultural and In-

dustrial Chemistry. Fruit and Vegetable Chemistry Laboratory, Pasadena, Calif. Jun 1952. 15p Available from Fruit and Vegetable Chemistry Laboratory, Pasadena, Calif. PB 108102

1. Citrus products - Pectin content 2. Tomatoes - Pectin content 3. Pectin - Determination 4. AIC-337.

Methods used at Western Regional Research Laboratory for extraction and analysis of pectic materials, by H. S. Owens, R. M. McCready, A. D. Shepherd and others. U. S. Bureau of Agricultural and Industrial Chemistry. Western Regional Research Laboratory, Albany, Calif. Jun 1952. 26p drawing, graphs Available from Western Regional Research Laboratory, Albany 6, Calif. PB 108103

1. Pectin - Determination 2. Pectin - Extraction 3. AIC-340.

Molds of meats, by F. A. Wolf. U. S. Quartermaster Food and Container Institute. Under Contract no. W11-183-qm-194.

Report no. 1 for period 1 Jul 1947 to 31 Oct 1948. 1948. 20p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108108

1. Meat - Preservation.

Report no. 3 for period 1 Jul 1947-30 Nov 1948. 1948. 16p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108006

1. Fungicides - Evaluation 2. Boric acid - Fungicidal effect 3. Crotonic acid - Fungicidal effect 4. Benzoic acid, p-Amino - Fungicidal effect 5. Sodium benzoate - Fungicidal effect 6. Acetic acid, 2,4,5 - Trichlorophenoxy - Fungicidal effect 7. G-4 (Trade name).

Report no. 4 for period 1 Jul 1947-30 Nov 1948. 1948. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $1.25, Photostat $1.25. PB 108007

1. Benzoic acid, p-Hydroxy - Fungicidal effect.

Report no. 5 for period 1 Jul 1947-1 Dec 1948. 1948. 13p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108008

1. Fungicides - Evaluation 2. Carvacrol - Fungicidal effect 3. Clove oil - Fungicidal effect 4. Thymol - Fungicidal effect 5. Stabilizer I (Trade name).

Report no. 7 for period 1 Jul 1947-1 Dec 1948. 1948. 12p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108009

1. Fungicides - Evaluation 2. Quinone - Derivatives - Fungicidal effect.

Report no. 8 for period 1 Jul 1947-1 Dec 1948. 1948. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108010

1. Fungicides - Evaluation 2. Benzoic acid, p-Hydroxy - Fungicidal effect 3. Hexamethylenetetramine - Fungicidal effect 4. Malonic acid - Fungicidal effect 5. Sorbic acid - Fungicidal effect

Nutritive value of Army rations, by C. A. Elvehjem, D. V. Tappen and U. J. Lewis. U. S. Quartermaster Food and Container Institute. Report no. 36 under Contract DA11-009-qm-11544, for period covering Aug 1, 1951 to July 31, 1952. 1952. 2p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107798

Cooperating institution: University of Wisconsin, College of Agriculture. Department of Biochemistry, Madison, Wis. Project no. 7-84-12-011.
1. Food rations - Nutritive value 2. Vitamins - Metabolism 3. Vitamin B_6 - Metabolism 4. K-rations 5. Wisconsin. University. Dept. of Biochemistry.

Prediction of consumer choice, by L. L. Thurstone and Lyle V. Jones. U. S. Quartermaster Food and Container Institute. Report no. 5 for period Sep 1, 1950-Jan 31, 1952 under Contract no. DA-11-009-qm-598. 1952. 7p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107805

Cooperating institution: University of Chicago. Division of Social Sciences. Dept. of Psychology.
1. Food preferences 2. Chicago. University. Division of Social Sciences. Dept. of Psychology.

Preparation of cottonseed meats for cooking prior to the extraction of the oil, by Charles G. Luedtke and A. Cecil Wamble, a cooperative investigation by the Cotton Research Committee of Texas and the Texas Engineering Experiment Station. Texas Engineering Experiment Station, College Station, Texas. Nov 1952. 11p photo, tables Available from Texas Engineering Experiment Station, College Station, Texas. PB 108049

1. Cottonseed - Processing 2. Cotton Research Committee of Texas 3. TU EES RR 39.

FUELS AND LUBRICANTS

Bericht über die untersuchung von butylolen (M_1- und M_2-fraktion) als zusatz zu Leuna-mischbenzin (Test of butyl oil (M_1 and M_2 fractions) used as admixture to benzene compounds), by Lieb. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Oct 1939. 9p graphs, tables (Text in German)

Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108153

Several butyl oils of high knock resistance and high thermic qualities, but not directly useable as propellants because of their high boiling point between 122 and 182°C, were tested as admixtures to various benzene compounds used at the Leuna Works. A 20 - 30% admixture gave practically the same performance at the same rate of consumption as Leuna benzene with lead content. The antiknock quality of the basic benzene is considerably improved by the admixture. There is no danger of pitch formation. Test results are shown in a numerical table and several graphs. Tech. Proefstand Op 200, Bericht nr. 403. Will not reproduce well.

Bonding of molybdenum disulfide to various materials to form a solid lubricating film. II: Friction and endurance characteristics of films bonded by practical methods, by Douglas Godfrey and Edmond E. Bisson. U. S. National Advisory Committee for Aeronautics. Oct 1952. 16p photos, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107706

1. Molybdenite - Bonding 2. Molybdenite - Use as a lubricant 3. Friction - Theory 4. Lubricants - Friction 5. Lubrication - Chemistry 6. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 7. NACA TN 2802.

Development and testing of fire-resistant hydraulic fluids, by D. H. Moreton. Douglas Aircraft Co., Inc., Santa Monica, Calif. n.d. 27p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108117

A survey was made of existing materials and preliminary tests were run in order to obtain a more fire-resistant hydraulic fluid for use in commercial air transports. Standard laboratory tests which were conducted include viscosity, cloud and pour point, acidity, effect on elastomeric packings, flash and fire point, and autogenous-ignition temperature. Fire tests consisted of a high-pressure arc test, a low-pressure spray test, and a simulated hot manifold test. It was found that an ester-base fluid such as DMX-8 offers significant and real improvement in hydraulic-fluid fire resistance, pump life and reliability and fluid stability.

Experimental investigation of eccentricity ratio, friction, and oil flow of short journal bearings, by G. B. DuBois and F. W. Ocvirk. U. S. National Advisory Committee for Aeronautics. Nov 1952. 79p photos, drawings, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107995

1. Friction - Theory 2. Lubrication - Theory 3. Bearings, Sleeve - Friction tests 4. Cornell University, Ithaca, N. Y. 5. NACA TN 2809.

Physical properties of chlorotrifluoroethylene polymers, a summary for practical applications, by W. H. Reysen and J. D. Gibson. Carbide and Carbon Chemicals Corporation. K-25 Laboratory Division, Oak Ridge, Tenn. Dec 1949. 14p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107993

The methods for determining the physical properties of $F_2C = CFCl$ are outlined. Molecular weight, density, viscosity, and vapor pressure values for selected fractions of $F_2C = CFCl$ liquid polymers were correlated for temperatures between 100° and 210°F. Polymer molecular weights ranged from 550 to 1300 units. Refractive index data which were correlated only for fractions of a single specimen were not included. Data and correlations are summarized in a form suitable from an engineering standpoint for the solution of lubrication and blending problems. Examples show the manner in which these curves may be used. K-538.

Preparation of standard sand as used in the British standard method for the determination of the agglutinating value of coal (B.S. 705: 1936), by A. J. Sharp. Gt. Brit. Dept. of Scientific and Industrial Research. Fuel Research Board. Mar 1952. 16p photos, drawing, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 108043

S. O. code no. 47-17-56.
1. Coal - Agglutinating properties - Gt. Brit. 2. Sands - Analysis - Gt. Brit. 3. Gray-Campredon test (Agglutinating properties of coal) - Gt. Brit. 4. Coal - Specifications - Gt. Brit. 5. DSI R FR TP 56.

Report no. 1 under Navy contract NObsr-42427, from inception to Sep 30, 1949. Bakelite Corporation, New York, N. Y. Sep 1949. 21p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107992

Appendix I is Volume expansion and melt viscosity characteristics of fluorothene, by H. F. Klemm and F. D. Dexter. Special report, Aug 2, 1948.
1. Polymers, Chlorotrifluoroethylene 2. Fluorothene - Viscosity 3. Fluorothene - Expansion.

Selected bibliography of coal gasification, by Robert M. Busche, Howard R. Batchelder, and Willard P. Armstrong. U. S. Bureau of Mines. Nov 1952. 30p Available from U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa. PB 108135

1. Coal - Gasification - Bibliography 2. BM RI 4926.

Thermodynamic functions of halogens and hydrogen halides, by Rudolph Edse. U. S. Air Materiel Command. Technical Intelligence Division, Propulsion Section. Nov 1949. 52p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107718

Thermodynamic values of the halogens and hydrogen halides for the temperature range from 298° to 6000°K are presented in this report. These data permit the calculation of the theoretical performance of high energy rocket propellants utilizing the halogens. The method of calculating the thermodynamic functions from spectroscopic data, by means of statistical mechanics, is presented. AAF TR 2250 IA.

HIGHWAYS AND BRIDGES

Highway relationships in Maryland, by Ralph S. Lewis and Norman Hebden, assisted by William L. Haas and Charles N. Graham. Highway Research Board. 1952. 62p map, fold diagr Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington, D. C. $.75. PB 107720

Appendix: Constitutional and statutory provisions, including public general laws and public local laws, affecting intergovernmental relationships in highway affairs in Maryland.
1. Roads - Construction - Law - Maryland 2. Road laws - Maryland 3. HRB SR 6.

Land acquisition and control of adjacent area, presented at the 31st annual meeting, Jan 1952. Highway Research Board. 1952. 62p maps, graphs, tables Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $.90. PB 108072

Contents: Report of Committee on land acquisition and control of highway access and adjacent areas, by David R. Levin. - Final report on the Minnesota roadside study, by O. L. Kipp. - Traffic accidents and roadside features, by J. Carl McMonagle. - Roadside zoning, by Erling D. Solberg.

Load capacity of roads affected by frost. Presented at the 31st annual meeting, Jan 1952. Highway Research Board. 1952. 22p photos, map, graphs, table Available from Highway Research Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. $.30. PB 108022

This is the fourth report covering work being done by various states on this research project. Previous reports were made in 1948, 1949 and 1950. The objective of the project is to determine the percentage loss of strength that may occur in highways subjected to freezing and thawing action. The reports submitted by the States of Iowa, North Dakota, Ohio and Oregon are included in this Bulletin. Both the North Dakota and Iowa projects continue to show loss in strength due to frost action. The Ohio test was made on a road of sufficient design strength to support the test load throughout the year. A full cycle of one year of tests has not been completed on the Oregon project. HRB Bul 54. NRC 232.

Summarised account of the Severn Bridge aerodynamic investigation, by R. A. Frazer and C. Scruton. Gt. Brit. National Physical Laboratory. Feb 1952. 130p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $5.75. PB 108084

S. O. code no. 48-124. NPL/Aero/222.
1. Bridges, Suspension - Design - Gt. Brit.
2. Bridges, Suspension - Stability - Gt. Brit.

INSTRUMENTS

Almost sinusoidal oscillations in nonlinear systems. Part II: Synchronization, by Johannes S. Schaffner. Illinois. Engineering Experiment Station, Urbana, Ill. May 1952. 33p diagrs, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $.25. PB 107871

Contract nos. AF33(038)-14538, AF33(038)-14742. University of Illinois Bulletin, Volume 49, Number 65, May 1952. University of Illinois. Engineering Experiment Station, Bulletin series no. 400.
1. Circuits, Oscillator - Nonlinear 2. Synchronization, Subharmonic 3. Oscillators, Tuned plate - Synchronization 4. Oscillators, Electron tube 5. Oscillators, Electron tube 6. Harmonics - Measurement 7. ILU EES B 400.

Chemical systems sensitive to radiation. Monthly report no. 16 under Contract no. DA18-108-CML-2562, Oct 1-Oct 31, 1952, by Irving A. Bernstein, Wolfgang G. Rothschild, Florence F. Spalding, Earle C. Farmer. Tracerlab, Inc., Boston, Mass. 1952. 11p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107998

To elucidate the nature of the reaction mechanism of the sensitizing effect of N-methylated p-aminocarbinols on anhydrous indicator-halogenated compound radiation dosimeters, the following groups of compounds have been investigated to evaluate their sensitizing properties: 1. Heterocycles containing nitrogen and alicycles with amino groups -- all of which are basis compounds, i.e., electron donors. 2. Alicycles with hydroxy or carbonyl groups. 3. Carbon disulfide. The most effective compounds studied were dimethylaniline, Michler's hydrol, and para-dimethylaminobenzaldehyde. A table illustrating the relative effectiveness of each sensitizer is reported.

Handbook, operation and service instructions: Multimeter TS-352/U (Phaostron). U. S. Air Force. Revised. Nov 1950. 11p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107742r

1. Multimeters - Maintenance and repair 2. Multimeters - Operation 3. TS-352/U (Multimeters) 4. AAF TO 16-35TS352-10, Revised.

Low temperature tests of the portable air sampler E22, by William P. McDonald and John F. Edwards, Jr. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Jul 1952. 17p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107874

Project 4-08-04-005.
1. Air - Sampling 2. Sampling devices - Tests 3. E22 (Air sampler) 4. CC CRL IR 161.

Measurement of micro-microcurie amounts of radon by a scintillation counting method, by J. Bryant and M. Michaelis. Gt. Brit. Ministry of Supply. Radiochemical Centre, Amersham, Bucks, Eng. 1952. 26p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107973

The problem of assaying micro-microcurie amounts of radon is considered with special reference to the measurement of radon content of exhaled breath samples from radium workers. An apparatus is described which uses a scintillation counting technique and which has the following advantages over previously-used methods. (i) The radon content of ordinary moist air samples may be measured without pretreatment of the sample. (ii) The apparatus is robust and insensitive to mechanical shock, electrical interference and gamma or cosmic ray background. (iii) A number of air samples may be measured in rapid succession by the use of separate sample chambers and one scintillation counting apparatus. The sensitivity of the equipment is such that a radon sample of 10^{-13} curies/litre approximately doubles the normal background counting rate. In addition to the assay of radon content of air, the apparatus may also be used for the measurement of Radium content of solutions using a de-emanating technique. S. O. code no. 70-674-0-82. RCC IR 26.

Miniature hot plate and radiant heat dryer, an A.E.R.E. report, by F. Hudswell and K. L. Wilkinson. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1950. 4p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107787

The details of construction and operation of a small hot plate are described. H.D. 412. S. O. code no. 70-674-0-7. AERE C/R 599.

Parts catalog: Multimeter TS-352/U (Phaostron). U. S. Air Force. Aug 1950. 17p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107743

Basic issue.
1. Multimeters - Parts 2. TS-352/U (Multimeter) 3. AAF TO 16-35TS352-12.

Piston thrust gage, by Alfred Africano. Final report, series J, no. 3.2, Contract OEMsr-273. U. S. Allegany Ballistics Laboratory, Cumberland, Md. Jan 1946. 12p photos, drawing, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107837

This report describes the development of a piston thrust gage designed to extend the range of measurable thrusts with a single unit in order to eliminate the need for having two different types of electrical strain gages to manufacture and keep in working condition, and in general to give more reproducible thrust data. Two models of the piston thrust gage were built and tested. The first, which served to show the feasibility of the principle and to indicate what improvements were necessary, was built at the Jet Propulsion Research Laboratory at Indian Head, Maryland. In spite of certain crude features in this first model, which were a result of unprecise machine work, it indicated significantly a better consistency in the effective gas velocity as calculated from the thrust measurements than did the existing bar-type thrust gages. The second model was designed to reduce friction and leakage and to improve handling procedure. It was built at the Allegany Ballistics Laboratory and again showed that more accurate and reproducible thrust measurements could be obtained. NDRC 3-1734. OSRD 5864.

Practical characteristics of the alpha-electroscope no. 1096, an A.E.R.E. report, by C. J. Mandleberg. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Sep 1950. 17p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107786

The way in which the discharge time of the α-electroscope No. 1096 depends on the strength of the source used to discharge it, and the effect on the discharge time of temperature and pressure, the thickness of the tray, and size and other physical characteristics of the source, are demonstrated and discussed. Recommendations for the most effective use of the instrument were made, and it is pointed out that it is hoped to construct an improved alpha electroscope whose design will be based on the data presented in this report. S. O. code no. 70-674-0-4. AERE C/R 582.

Progress report (2) on the EDVAC, vol. I, covering chapters I-III. Report of work under Contract no. W-670-ORD-4926, supplements nos. 4 and 7, and under Contract no. W-36-034-ORD-7593, edited by T. Kito Sharpless. Pennsylvania. University. Moore School of Electrical Engineering, Philadelphia, Pa. Jun 1946. 114p drawings, diagrs (part fold) graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108132

For vol. II see PB 108133. For 1st report see PB 110330-110331.
1. EDVAC (Binary electronic digital computer) 2. Computers, Binary 3. Computers, Electronic.

Pulse amplitude analyser, an A.E.R.E. report, by E. W. Titterton. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Dec 1950. 5p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107965

The possibilities of a new form of pulse amplitude analyser (so-called kick sorter) are considered. Sorting is achieved on a system of electrodes located in the plane of the screen in a cathode ray tube. Development work is in progress to assess the practicability of the method. This pulse amplitude analyser is the subject of U.K. patent No. 639283. Revised version of G/MI. This analyser is the subject of U.K. patent no. 639283. S. O. code no. 70-674-0-12. AERE G/R 620.

Several combination probes for surveying static and total pressure and flow direction, by Wallace M. Schulze, George C. Ashby, Jr. and John R. Erwin. U. S. National Advisory Committee for Aeronautics. Nov 1952. 64p photos, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108032

1. Compressors, Turbo - Flow measurements 2. Engines, Turbine propeller - Tests 3. Static pressure tubes 4. Reynolds number - Effect 5. Mach number - Effect 6. Pitot-static tubes - Wind tunnel tests 7. Pressure, Air - Probes 8. Instruments, Measuring - Pressure 9. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 10. NACA TN 2830.

Simple air ejector as a suction motor for dry boxes, an A.E.R.E. memorandum, by J. R. Catlin, L. Coward, D. Darling, W. T. Spragg, C. G. Webb. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 14p drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107960

S. O. code no. 70-674-0-77. Appendix: Design for the manufacture of an air ejector from standard copper alloy pipe fittings for obtaining reduced pressure in dry boxes, by P. G. Reynolds.
1. Atomic power - Research - Gt. Brit. 2. Ejectors, Air - Design - Gt. Brit. 3. Ejectors, Air - Uses - Gt. Brit. 4. AERE C/M 152.

Thermodynamic limitations of ice accretion instruments, by D. Fraser, C. K. Rush and D. Baxter. Canada. National Aeronautical Establishment. Aug 1952. 30p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Available for exchange from National Aeronautical Establishment, Ottawa, Canada. PB 107683

A number of instruments used for determining the supercooled water content of an icing cloud depend on measuring the rate of accretion of ice on an unheated body. It has been shown by Ludlam that, since only part of the supercooled water freezes on impact, and the rest cannot always be frozen by the limited convective and evaporative heat losses which are available, there are limiting water contents beyond which such methods of measurement are unreliable. These limits have been calculated for a rotating cylinder at normal and high flight speeds, and the results show that rotating cylinder measurements are of limited usefulness and may, in fact, prove entirely misleading as regards both water content and droplet size. Contents: Appendix A: Calculation of the Ludlam limits for rotating cylinders. - Appendix B: Calculation of a Ludlam limit for a rotating disc. NAEC LR 32.

Ultra-high frequency deflection oscillator, by William J. McBridge, Jr. California. University. Institute of Engineering Research Microwave Laboratory, Berkeley, Calif. Feb 1952. 100p photo, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 107583

A new type of ultra-high frequency electron deflection tube is described which holds promise for moderate and high power applications. A high input impedance is obtained by employing a high Q cavity resonator as the input tuned circuit and electron transit times in the deflection plate region for which the net r-f energy transferred to the electron beam is ideally zero. A low output impedance is made possible by a particular tube geometry and a new anode circuit which permit relatively large currents to be used. From a detailed analysis of the principles of operation and design considerations an experimental tube was designed and constructed. The experimental results verify the validity of the fundamental principles. Some possible applications of these principles are described. Contracts nos. W-33-038-ac-16649 and W-19-122-ac-38. Thesis - University of California. UC IER ML TR Ser no. 1, Issue no. 55.

Voltage stability of synchronous altermators with capacitive loads, by Erkki Volpio. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1952. 65p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107946

If the load connected to a synchronous alternator consists of a sufficiently large capacitance, the voltage becomes unstable. The analytical conditions for voltage stability are given, both for fixed exciter voltage and in the case of high-speed automatic voltage regulation. The variation in the reactances of the machine caused by saturation in the iron parts is investigated by measurements with a large capacitive load. It is found from the physical relations that saturation in general increases the possible load. This is also true in the case of automatic regulation, where the limit is mainly defined by the quadrature-axis reactance. These results have been checked by tests. Acta polytechnica 106, Electrical engineering series vol. 4, no. 7. Also published as Kungliga Tekniska Högskolans Handlingar nr. 56.

MINERALS AND MINERAL PRODUCTS

Analysis of rare earths by secondary X-ray emission spectra using a high intensity X-ray source and a Geiger counter spectrometer, by G. L. Clark, W. F. Wagner and D. W. Carley. Illinois. University, Urbana, Ill. Aug 1947. 15p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107695

Contract N6ori-71, Chemistry task no. VII.
1. Earths, Rare - Spectrographic analysis 2. Rubidium chloride - Spectrographic analysis 3. X-rays - Spectroscopy 4. Spectrometers, Geiger counter

Building limes. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Sep 1952. 4p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 108048

L. S. O. code no. 72-22-0-46.
1. Lime - Chemical properties - Gt. Brit. 2. Lime - Uses - Gt. Brit. 3. Lime, Calcinated - Uses - Gt. Brit. 4. Lime, Hydraulic - Uses - Gt. Brit. 5. Calcium oxide - Uses - Gt. Brit. 6. Mortar (Building material) - Lime - Gt. Brit. 7. DSIR BRD 46.

Dosimetry of ionizing radiations by means of color centers in sensitized alkaline-earth salts, by James H. Schulman, Robert J. Ginther, and Russell D. Kirk. U. S. Naval Research Laboratory. Oct 1952. 19p graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111074

The relationship of lattice defects—particularly vacancies and impurity ions—to the X-ray-induced discoloration of alkali-halide crystals is briefly reviewed. These concepts are then extended to alkaline-earth salts. Crude dosimeters made from sensitized strontium sulfate are described. It is found possible to distinguish between doses of 0, 50, 100, 200, and 400 roentgens of radium gamma rays by simple visual inspection of these dosimeters. NRL R 4062.

Electrostatic separation of minerals, a bibliography of published papers, by R. Clarke. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Dec 1951. 4p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107971

S. O. Code no. 70-674-0-69. AERE Inf/Bib. 80.
Compiled mainly from Chemical abstracts 1907-1951.
1. Atomic power - Research - Gt. Brit. 2. Separation, Electrostatic - Bibliography - Gt. Brit. 3. AERE Inf/Bib 80.

Establishment of a dielectric material pilot plant. Interim engineering report no. 1 under Contract no. AF 33 (600)-15608, by D. W. Kocher and E. J. Haddox. Glass Fibers, Inc., Waterville, Ohio. Jul 1952. 23p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107934

A description of a glass making process is given, including batch composition, furnace design, melting procedure, and forming apparatus. The glass marbles made will be drawn into glass fibers. The glass is essentially a low alkali borosilicate having a low dielectric constant and a high resistance to attack by moisture. Contract AF 33(600)-15608. Continuation of work done under Contract AF 9(038)-8063.

Improved ceramics. New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. First quarterly progress report under Contract no. W36-039-sc-38188, period 1 Mar to 1 Jun 1949, by N. H. Snyder, E. J. Smoke, W. A. Scholes, H. R. Wisely. Jun 1949. 161p drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Photostat $21.25. PB 107987

Continuation of work under Contract W36-039-sc-32028. Part 3 is omitted. Contents: Part I. Development of ceramic bodies with high thermal conductivity. - Part II. High thermal shock ceramics. - Part IV. Development of ceramic materials free of electrolytes. - Part V. Development of dense cordierite bodies.
1. Ceramics - Thermal conductivity - Bibliography 2. Ceramics - Thermal conductivity - Measuring equipment 3. Thermal conductivity - Measuring equipment 4. Beryllium oxides - Thermal properties 5. Magnesia - Thermal properties 6. Cordierite - Dielectric properties.

Investigations of rare earth problems. Illinois. University, Urbana, Ill. Under contract N6ori-71, Chemistry task no. VII.

Quarterly progress report no. 4, Mar 1, 1947 to Jun 1, 1947. Jun 1947. 28p graphs, tables Available from Library of Congress, Publication Board Project Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108207

Progress of an investigation of rare earth problems is described. Analytic results for volumetric and 8-hydroxyquinoline procedures for thorium are presented. The iodate procedure shows considerable promise and is being extended to monazite samples and various thorium-rare earth combinations. Exchange studies have been extended by means of column technique to both rare earth and thorium-rare earth mixtures. Work is being started on counter-current ion migration. A large range of concentrations and mole ratios of uncomplexed neodymium-praseodymium chloride mixtures have been put through the thermal-diffusion apparatus. Investigation of radioactivity of monazite ores and solutions of thorium salts for analytical use disclosed the effect of layer depth of a solid sample, variation of activity with weight per cent of radio active material, negligible effect of bulk density of solid sample within certain limits, and effect of particle size.

Quarterly progress report no. 6, Sep 1, 1947-Dec 1, 1947. Dec 1947. 35p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108041

Progress made in investigations of rare earth problems is described. Work on the development of analytical methods included completion of the volumetric iodate method for thorium and further studies on spectrophotometric methods for rare earth analyses. Studies preliminary to a detailed investigation of cerium as a separatory agent in lanthanum - praseodymium separations are reported. Further studies of thorium - neodymium mixtures have shown the feasibility of effecting separation by use of hydrochloric acid as eluant. Higher valence states of praseodymium are under study in order to develop a method of separating the element from the other rare earth elements. Phosphoric acid derivates of the rare earths are being investigated to effect an improvement of present processes for opening up rare earth monazite ores.

Quarterly progress report no. 8. Jun 1948. 40p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $2.25, Photostat $5.00. PB 107697

1. Earths, Rare - Spectrographic analysis 2. Earths, Rare - Phosphoric acid derivatives 3. Oxides, Rare earth - Solubility 4. Gadolinium - Polarographic analysis 5. Neodymium - Polarographic analysis 6. Praseodymium - Electrolysis.

Quarterly progress report no. 12 for period Mar 1, 1949-Jun 1, 1949. Jun 1949. 41p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107831

1. Earths, Rare - Spectrographic analysis 2. Lanthanum - Ion exchange 3. Thorium - Ion exchange 4. Praseodymium - Oxides 5. Quinoline, 8-Hydroxy.

Final report. Sep 1950. 111p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 107701

Contents: I. Introduction. - II. Hypophosphate studies, by T. Moeller and G. H. Quinty. - III. Effects of added anions upon the absorption spectra of certain rare earth metal ions, by T. Moeller and A. M. Ross. IV. Complexes of the rare earths with ethylenediaminetetracetic acid, by T. Moeller and F.A.J. Moss. - V. Solutions of rare earth compounds in anhydrous ethylenediamine, by T. Moeller and P. A. Zimmerman. - VI. Phosphates and polyphosphates of the rare earths and thorium, by R. F. Audrieth, J. R. Mills, P. R. Kippur, R. Gher. - VII. Accomplishments under Task VII. Work accomplished since 1 June 1949 is reported for research concerned with the effects of added anions upon the absorption spectra of certain rare earth metal ions, complexes of the rare earths with ethylenediaminetetracetic acid. They include the evaluation of conditions essential to the separation of rare earths from each other and from Th by ion exchange, development of a rapid quantitative titrimetric method for determining Th in the presence of the rare earth elements, evaluation of absorption spectra and development of a quantitative spectrophotometric method for determining rare earth metal ions, evaluation of the effects of complexing groups upon the absorption spectra of certain of these ions, the determination of extraction characteristics of rare earth ions as chelated derivatives and the use of N_2H_4 in the reduction of the higher oxides of Pr.

Mechanical property tests on ceramic bodies, by W. H. Duckworth, A. D. Schwope, J. K. Johnston, S. J. Stockett, J. L. Robert, H. Z. Schofield. Battelle Memorial Institute, Columbus, O. Apr 1951. 68p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108095

Continuing study is being made to increase knowledge of load-bearing characteristics of ceramic bodies. During the past year, room-temperature data were obtained from tension, compression, torsion, and bend tests on K151A, a nickel-titanium carbide product. Tension, compression, and bend tests gave about the same value for Young's modulus, 54.5×10^6 psi, and for Poisson's ratio, 0.22. These were related to the modulus of rigidity from the torsion test, 23×10^6 psi, in a manner to indicate isotropy. Material exhibited slight plastic flow, with different proportional limit in each test. Mode of fracture followed that normally found in brittle materials, and strength values are presented by a table. Progress was made in developing equipment for high-temperature tests. Work was done on four types of strain-measuring devices. Contract no. AF33(038)-8682. AAF TR 6512.

Reactions between aggregates and cement. Part 1. Alkali-aggregate interaction: General, by F. E. Jones. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Apr 1952. 30p map, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 108047

S. O. code no. 47-551-14.
1. Cements - Effects of alkali-aggregate interactions - Gt. Brit. 2. Silicates, Alkali - Reactions - Gt. Brit. 3. Aggregates, Cement-bonded - Gt. Brit. 4. Concrete aggregates - Gt. Brit. 5. DSIR NB TP 14.

Reconstituted mica and synthetic mica, by Paul M. Tyler. National Research Council. Division of Engineering and Industrial Research. Minerals and Metals Advisory Board. Aug 1952. 73p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. Limited supply available free from Minerals and Metals Advisory Board, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. PB 108014

Appendix A: Samica, by Harold V. Howe.
1. Mica, Synthetic - Production 2. Mica industry 3. Samica (Trade name) 4. MMAB 31-C.

Some aspects of the solution chemistry of zirconium, an A.E.R.E. report, by B.A.J. Lister and (Miss) L. A. McDonald. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1951. 51p drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.60. PB 107962

The report deals with some aspects of the chemistry of zirconium in nitric, hydrochloric, perchloric and sulphuric acid solutions. S. O. code no. 70-674-0-53. AERE C/R 801.

Wet combustion, a process for the utilization of peat, by K. N. Cedarquist and P. Bering. 1952. 35p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107945

This investigation has made possible a new technique, "wet combustion", the main principle of which is the reaction of wet peat with oxygen or air at 170–200° C and 15–30 kg/cm^2. Burning 10–20% of the organic material will yield enough heat to raise the temperature of the whole mass to such a level that the filtration properties of the slurry improves by a factor of 50–100. A few systems for carrying out this reaction have been designed and various factors such as the consumption of oxygen, heat, and rate of reaction as well as various technical problems have been studied both in small-scale laboratory apparatus and in a pilot plant. Methods for analyzing the various operations and for calculating the performance of equipment have been developed, and finally a couple of applications, particularly gasification, are discussed. Acta polytechnica 105, Chemistry including metallurgy series vol. 3, nr. 1.

ORDNANCE AND ACCESSORIES

Direct measurement of burning rates by an electric timing method, by Bryce L. Crawford, Jr. and Clayton Huggett. Minnesota. University. Aug 1944. 20p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107857

A simple and convenient apparatus for the direct measurement of burning rates of powder strands is described. The method is rapid and precise and uses small, easily prepared samples. When certain precautions are observed, the burning rates measured in this way are shown to be characteristic of the powder composition alone. The electric timing method is considered simpler than the photographic method and preferable to it for measurements of a routine nature on powders that are known to burn regularly. Since erosion and radiation do not affect the results the method may be limited in its usefulness for ballistic purposes but increased in value for theoretical investigations. Contract OEMsr-716. NDRC AOR A-286. OSRD 4009.

Line focus guns, by C. J. Carter. Ohio State University Research Foundation, Columbus, Ohio. Jun 1952. 15p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108027

Contract no. W33-038-ac-15162. RDO no. R-111-51. 1. Electron beams - Focussing 2. Guns, Electron - Design 3. Electrons - Trajectories 4. AAF WADC TR 52-172.

Long range shock propagation in under water explosion phenomena. Woods Hole Oceanographic Institution, Woods Hole, Mass. Contract NOrd 9500.

Part I, by A. B. Arons and D. R. Yennie. Apr 1949. 23p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107714

Peak pressure and time constant similarity curves for TNT and pentolite shock waves in water have been extended to longer ranges than heretofore investigated ($W^{1/3}/R$ of the order of 0.0002). Oblique reflections of shock waves from the sea bed were found to exhibit distortions not observed in earlier experiments under conditions of less oblique incidence. The distortion is shown to be associated with a critical angle of total reflection dependent upon the acoustic properties of the water and the sea bed, and a theory of the effect is developed. NAVORD 424.

Part II, by A. B. Arons, D. R. Yennie and T. P. Cotter, Jr. Oct 1949. 114p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 107715

The theory of oblique reflection of low amplitude exponential shock waves is considered in more detail than in the preceding report (NavOrd 424) and is extended to include higher order reflections in shallow water. Errors arising from use of the plane wave approximation are discussed. Recently published data on the attenuation of harmonic sound waves in sea water are used to develop a theory of the effect of viscous attenuation on the front of a shock wave propagating over long ranges. Crude correction is made for the compensating effects of finite amplitude. Experimental data on impulse and energy flux at long ranges are reported. The energy dissipation is analyzed in terms of the theory of viscous attenuation and an attempt is made to account for the slope of the pressure-distance curve. Experimental data on negative gauge pressures in surface reflections are reported and analyzed in terms of a new treatment of the expected region of bulk cavitation. The data indicate a very low value of the "breaking tension" of sea water. An improved microcoulometer circuit for the calibration of piezoelectric gauges is described. NAVORD 478.

Metallurgy, heat-treatment, and allied phases of M1, caliber .30 manufacture, by E. L. Wood. U. S.

Armory, Springfield, Mass. Aug 1951. 8p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108036

The Armory's current practice covering certain phases of manufacture of M1 barrels is summarized. Information relating to raw materials, heat-treating practices and its control, straightening, and other details, is included. Project no. TS3-3039. SA MR 1-1002.

Operation and evaluation of the beacon triangulation system and the Ionosphere beacon system, by H. E. Harrington. Oklahoma Agricultural and Mechanical College. Research Foundation. Final report under Contract no. W28-099-ac-376. 1952. 17p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107937

1. Triangulation 2. Trajectory determination 3. Antennas, Helical 4. Ballistics, Rocket - Exterior - Measurements.

Report on firing of first eleven rounds in 3-in. gun at David W. Taylor Model Basin during May, June, July 1943. U. S. National Bureau of Standards and Carnegie Institution of Washington, Geophysical Laboratory. Nov 1943. 151p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.00, Photostat $20.00. PB 107821

Work at the Geophysical Laboratory was done under Contract OEMsr-51.
1. Ballistics, Interior - Research 2. Guns - Performance - Recording 3. Instruments, Measuring - Ballistics 4. NDRC AOR A-229 5. OSRD 2019.

Some comments on the Morse theory of fragment damage, by Henry Scheffe. Princeton University, Princeton, N. J. Dec 1945. 19p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107839

The purpose and general nature of the Morse theory of fragment damage are discussed and some very general probability considerations are advanced which indicate that the theory tends to overestimate the damage expectancy. It is pointed out that the Morse calculations are affected by some large uncertainties of estimation inherent in the highly variable nature of the phenomena of fragmentation. Some elementary statistical considerations show that with the experimental setup used in the past, a difference in the Morse indices of two explosives is not to be regarded as statistically significant by customary standards unless the difference is about 30 percent. The appendix outlines some of the Morse calculations and the assumptions on which they are based. NDRC Memo A-111M. NDRC 2-453. OSRD 6426.

Supplementary instruction book for antisubmarine practice targets, manufactured for U. S. Navy Dept., Bureau of Ships by University of California, Division of War Research, at the U. S. Navy Radio and Sound Laboratory. California. University. Division of War Research. Apr 1944. 93p photos, drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 107780

1. Targets, Underwater 2. Anti-submarine warfare - Training devices 3. RR1 (Target) 4. KR1 (Target) 5. KR2 (Target) 6. BR1 (Target) 7. SR2 (Target) 8. SR5 (Target) 9. U. S. Navy Radio and Sound Laboratory, San Diego, Calif. 10. UC DWR R200 11. NDRC 6.1-1684 12. OSRD 3806.

PAPER AND ALLIED PRODUCTS

Electrical properties of silica fiber paper, by T. D. Callinan and R. T. Lucas. U. S. Naval Research Laboratory. Oct 1952. 12p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111077

The preparation and properties of paper made from hydrous and anhydrous silica fibers are described and the combinations of these fibers with various commercial resins evaluated. Although this paper was found to be mechanically weaker than previously developed glass fiber paper, it has a much greater thermal resistance. NRL R4064.

Manufacture and properties of paper made from ceramic fibers, by T. D. Callinan and R. T. Lucas. U. S. Naval Research Laboratory. Oct 1952. 8p photos, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 111075

During a continuing study of the properties of inorganic papers, the properties of ceramic fibers have been determined. The paper is mechanically weak when only ceramic fibers are used, but the electrical properties are exceptionally fine and losses are one fourth those of kraft paper. Mechanically strong paper can be prepared by adding resins to the furnish; additional strength may be imparted by the use of a filler such as bentonite. It was also found that dipping the paper in one of a number of varnishes markedly improved the mechanical and electrical properties. NRL R 4044.

PERSONNEL APTITUDE TESTING

Military attitude as a predictor of air force success; preliminary studies of the attitude survey, by Ernest C. Tupes and James K. Yarnold. U. S. Air Training Command. Human Resources Research Center. Personnel Research Laboratory, Lackland

Air Force Base, San Antonio, Texas. Jul 1952. 27p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107726

Project no. 503-002-0007.
1. Attitude survey 2. SX-AS-B (Attitude survey) 3. SX-AS-A (Attitude survey) 4. Military training - Mental attitude 5. Office candidate school - Qualifications 6. Aircrew classification battery 7. Personnel, Flying - Selection 8. Pilots, Air - Selection 9. Tests, Officer qualification 10. AAF HRRC RB 52-23.

Qualitative determination of naval officer manpower requirements, by C. Thomas Clifton. Clifton Corporation, Washington, D. C. Nov 1952. 26p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108106

Contract Nonr-520(00).
1. Personnel, Naval - Classification.

Review of the literature on methods of measuring pilot proficiency, by Sanford C. Ericksen. U. S. Air Training Command. Human Resources Research Center. Pilot Training Research Laboratory, Goodfellow Air Force Base, Texas. Aug 1952. 27p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107728

Project no.: 508-016-0003. Contract no.: AF 33(038)-23183.
1. Pilots, Air - Ability tests 2. Pilots, Air - Training 3. American Institute for Research, Inc., Pittsburgh, Pa. 4. AAF HRRC RB 52-25.

Symposium on research in occupational classification (Proceedings of the 18th meeting of the Panel on Manpower) 5-6 May 1952. U. S. Research and Development Board. 1952. 78p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108013

HMP 201/1. Contents: Research into basic methods and techniques of Air Force job-worker analysis, by Jesse C. Rupe. - New techniques in job analysis in the Navy, by J. B. Murphy. - Utilization of new techniques in job-analysis methodology, by Harry I. Hadley. - Development of methodology for determining physical standards, by Roger M. Bellows. - Development of the Naval officer job-classification structure, by D. George Price. - Use of ONJC in determining Naval officer manpower requirements, by C. Thomas Clifton. - Development of a functional classification system, by Carl A. Heinz. - Research developments in job analysis as applied to areas of training, manpower utilization, and organization, by Alton W. Baker.
1. Job analysis 2. Personnel - Classification 3. Personnel, Flying - Classification 4. Personnel, Naval - Classification.

PHOTOGRAPHIC AND OPTICAL GOODS

Photochemical studies. Connecticut. University, Storrs, Conn. Under Contract DA36-039-sc-211. Dept. of the Army project no. 3-99-04-052. Signal Corps project no. 36-195B.

First quarterly report, Oct 1, 1950 to Dec 31, 1950, by Charles E. Waring and Roland Ward. Dec 1950. 17p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108016

1. Photochemistry 2. Photographic papers - Development.

Second quarterly report, Feb 1, 1951 to Apr 30, 1951, by Charles E. Waring and Roland Ward. Apr 1951. 18p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108017

The property of electrolyzed stannous chloride solutions to reduce photographic emulsions (silver halide) is due to formation of some anionic species of Sn (LL). Rate and extent of reduction by this reagent are increased by increasing hydroxyl ion concentration and decreased by adding bromide ion to the solution. Potassium trioxalatomanganiate, -cobaltiate, and -ferriate have been prepared. These compounds have been used to prepare light sensitive paper. Maganiate and cobaltiate papers give direct positive print; ferriate gives a negative. Decolorization of solutions of methylene blue and Gentian violet by certain silver activated zinc sulfide phosphors has been shown to be a process of chemical reduction rather than adsorption.

Third quarterly report, May 1, 1951 to Jul 31, 1951, by Charles E. Waring and Roland Ward. Jul 1951. 23p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108018

The potassium salts of the trioxalato complexes of trivalent chromium, manganese, iron, and cobalt undergo slow photochemical decomposition. Other salts of these complex ions have been prepared using cations other than potassium in the hope that the cation may have some influence on the sensitivity of the compounds to light. Among the compounds prepared, the silver trioxalato cobaltate (III) and the trioxalato chromate (III) appear to be the most sensitive. An apparatus has been constructed to study the photodecomposition of the solid trioxalato complexes. A series of preparations has been undertaken attempting to introduce the peroxydisulfate ion into the double salt $A_{g3}K/Fe(CN)_6/$ in order to produce a photosensitive compound. Some of these compounds show limited photosensitivity, while all of them are affected by heat. The oxalate ion has been introduced into

ethylenediamine complexes of cobalt with the formation of a product, apparently not photosensitive.

Fourth quarterly report, Aug 1, 1951 to Oct 31, 1951, by Charles E. Waring and Roland Ward. Oct 1951. 24p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108019

A qualitative study of the photolysis of barium trioxalato ferrate (III) has been made. The decomposition products of these reactions have been determined. Adaptation of the methods used for the qualitative study to a quantitative study has been found inadvisable. A tentative method for a quantitative study of the photolysis of these compounds has been proposed. The introduction of peroxydisulfate ion into ethylenediamine complexes of cobalt produces substances which are apparently not photosensitive. The treatment of ethylenediamine complexes of chromium with silver nitrate and ammonium peroxydisulfate yields upon treatment with alcohol a precipitate which appears to be silver sulfate contaminated with some chromate. The product is definitely sensitive to ultra-violet and shows some reversal upon exposure to infra-red.

Fifth quarterly report, Nov 1, 1951 to Jan 31, 1952, by Charles E. Waring and Roland Ward. Jan 1952. 27p drawing, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108020

A vacuum apparatus has been designed and constructed for use in measuring the gas evolved during the photolysis of various oxalato complexes. Several runs have been made on samples of sodium trioxalato ferrate (III) weighing from 1.0 to 3.5 mg. It has not been possible to make a kinetic interpretation from the data obtained. Some pyridine and a,a-dipyridal complexes of silver with peroxydisulfate have been prepared and their reaction to ultra-violet investigated. A solid mixture of bis-a,a-dipyridal silver (II) peroxydisulfate with anhydrous oxalic acid exhibits some sensitivity to ultra-violet and infra-red. A survey of the photosensitivity of coordination compounds in general has been untertaken.

Sixth quarterly report, Feb 1, 1952 to Apr 30, 1952, by Charles E. Waring and Roland Ward. Apr 1952. 29p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $2.00, Photostat $3.75. PB 108021

Several compounds have been prepared employing peroxydisulfate ion. Qualitative tests show the presence of peroxydisulfate. Some of these compounds are sensitive to ultraviolet. An apparatus has been constructed for examination of the photosensitivity of solid coordination compounds. Some promising results have been obtained. A method of steam developing exposed sodium sodium trioxalate ferrate (III) has been found. The process involves the formation of a highly colored organic complex of Fe (II). It has been found that silver mercurous trioxalato manganate (II) undergoes no observable change on exposure to γ-rays. It was also found that infrared light does not restore this compound to its original form after it has been exposed to ultraviolet light. A new method of preparing potassium trioxalato cobaltate (III) has been developed. Attempts have been made to study the kinetics of the ultraviolet photolysis of sodium trioxalato ferrate.

Trajectory determination by tracer photography, by W. D. Crozier. New Mexico. University, Albuquerque, N. M. Jul 1944. 31p photos, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107835

A simple and usefully accurate method of trajectory determination is described. A camera, with a "chopper" vibrating in front of the open lens, photographs the trajectory of a tracer projectile. The determination of both position and time at closely spaced points is then made, by calculations based on the geometry of the setup. Complete data can be obtained from the firing of one round. In Sec. 1 the apparatus and setup are described. In Sec. 2 the formulas used in calculating the results are derived, while in Sec. 3 are disclosed some practical requirements and limitations in use of the method and some sources of error are mentioned. Section 4 exhibits results obtained with several projectiles, the calculations of one case being carried through in detail. Contract CEMsr-668. NDRC AOR A-283. OSRD 3890.

PHYSICS

General

Atmospheric diffusion from a line and point source of mass above the ground, by C. S. Yih. Colorado Agricultural and Mechanical College. Civil Engineering Dept., Fort Collins, Colo. Apr 1952. 11p Available from Civil Engineering Dept., Colorado A and M College, Fort Collins, Colo. PB 107921

Report no. 6 under Contract N9 onr 82401, NR063-071/1-19-49. For Report no. 4 see PB 105523.
1. Equations, Differential 2. Diffusion theory
3. Atmosphere - Diffusion.

Bibliography on microseisms. Second edition, revised and enlarged, edited by B. Gutenberg and F. Andrews. California Institute of Technology. Seismological Laboratory, Pasadena, Calif. Sep 1952. 95p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 107936

Contribution no. 602 from California Institute of Technology. Division of Earth Sciences. Scientific report no. 1 under Contract AF (122) 436.

Configuration of a wire towing a submerged body, by S. T. Mathews and Helen A. Tulloch. National Research Council of Canada. Sep 1952. 11p diagr,

graphs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Available for exchange from Division of Mechanical Engineering, National Research Council of Canada, Montreal Road, Ottawa, Canada. PB 108042

This report gives the theory involved in the solution of sub-surface towing problems. Some practical curves, for use with wires which may be considered light in relation to the hydrodynamic forces on them, are given. Laboratory report, model Testing Basin, MB-150. NRCC MB-150.

Doppler frequency change in radiation from the waves of the sea, by E. O. Hulburt. U. S. Naval Research Laboratory. Dec 1944. 13p photo, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107845

1. Doppler effect 2. Waves, Ocean - Refraction phenomena 3. NRL H2422.

On the solution of linear simultaneous differential equations with constant coefficients by a process of isolation, by J. Morris. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1947. 7p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107914

In this report a process is given for the solution of linear differential equations with constant coefficients. The operative artifice is closely akin to Routh's method of isolation by means of which the constants of integration are found separately for each root of the characteristic equation. Cover date is 1952. S. O. code no. 23-2623. ARC RM 2623.

Performance tests in physics, by Haym Kruglak. Minnesota. University. Physics Dept. Oct 1952. 45p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108000

The study dealt with characteristics of performance tests in general college physics. The relationships between performance tests and other measures of aptitude and achievement were explored. Contract N8onr-66213, Project NR192-041.

Reflection of small-change shock waves from a free surface, by G. M. Sokol. Woods Hole Oceanographic Institution. Underwater Explosives Research Laboratory, Woods Hole, Mass. Dec 1947. 36p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107713

This report presents the results of piezoelectric measurements of underwater explosion pressure waves generated and observed near the free water surface. The charge-surface-gauge positions were such that the rarefaction wave resulting from reflection of the compression wave at the surface was propagating in the moving and compressed medium not far behind the shock front. Under these conditions, the interaction with the surface deviates from the predictions of simple acoustic theory. NAVORD 410.

Relative intensities in the sound field, an abstract of "Sonic characteristics of the sound field in the sea." Prepared for NDRC at the U. S. Navy Radio and Sound Laboratory, San Diego, Calif. California University. Oceanographic Division. Apr 1942. 45p diagrs, (part fold), graphs, (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107855

Section no. C4-sr 30-083.
1. Sound, Underwater - Intensity 2. Sound, Underwater - Speed - Depth distribution 3. Sound, Underwater - Reflection 4. NDRC Div C sec C-4 5. OSRD 546.

Shock waves started by an infinitesimally short detonation of given (positive and finite) energy, by John Von Neumann. Princeton University, Princeton, N. J. Jun 1941. 35p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107854

1. Shock waves - Computation 2. OSRD 193.

Stream functions for three-dimensional flows, by J. H. Giese. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. May 1950. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108260

Three-dimensional, steady, non-viscous, adiabatic flows with vorticity can be described by means of two stream functions which have properties analogous to those of the stream functions for plane and axisymmetric flow. These functions have been used to show that the equations for three-dimensional flow are necessary and sufficient conditions that $(p + \rho u^2)\, dV$ be stationary. Project no. TB3-0108H of the Research and Development Division, Ordnance Dept. APG BRL R723.

Velocity distribution on a family of thin conical bodies with zero incidence according to linearized supersonic flow theory, by Fritz Hjelte. Sweden. Kungl. Tekniska Högskolan. Institutionen för Flygteknik. Jun 1952. 16p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107684

The velocity distribution on thin and symmetric cones has been calculated for a family of simple conical bodies. The method used here was developed by Behrbohm and Oswatitsch on the basis of linearized supersonic flow theory. The family consists of cones symmetrical in two orthogonal planes, which give rise to velocity distributions in terms of finite series

of elementary functions. More general cones can easily be investigated by combining some members of this family. Numerical values and graphs are presented for some of these cones. The results have been applied on a cone with bi-parabolic cross section. KTH AERO TN 22.

Nuclear

Bibliography on fission. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1951. 33p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 107970

The bibliography is arranged in two parts, as follows: - Part I - Published Literature. The references in this section are culled from Nuclear Science Abstracts, Science Abstracts A and Chemical Abstracts and cover the period from January 1946 onward. References are listed in order of date of publication (the most recent first) and in alphabetical order of authors when there are several references of the same date. The reference to the abstract is given in the last line of each item. Part II - Unclassified Reports. References to reports are listed in order of report number. S. O. code no. 70-674-0-68. AERE Inf/Bib 76.

Chemical manipulation of 200-gram amounts of irradiated thallium at the activity level of about 5 curies of Tl^{204}. The reaction $Tl^{203}(n,p)Hg^{203}$, an A.E.R.E. memorandum, by W. J. Arrol, J. Chadwick, J. Eakins. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Mar 1952. 8p photo, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107968

S. O. code no. 70-674-0-66.
1. Atomic power - Research - Gt. Brit. 2. Thallium - Irradiation - Gt. Brit. 3. Thallous sulfide - Preparation - Gt. Brit. 4. Thallous hydroxide - Preparation - Gt. Brit. 5. AERE I/M 16.

Circular wave-guide magic-tee, and its application to a wave-guide bridge for the combination of unequal powers, and a phase-shifter utilising circular polarisation, an A.E.R.E. report, by B. E. Kingdon. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1950. 23p drawings, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107791

The circular wave-guide magic-tee in various forms has been previously described in wave-guide literature. The present report describes an experimental model constructed on S-band. An account is given of the practical results obtained from the application of this device to a wave-guide bridge circuit for the combination of two R.F. powers or the division of a given power in any desired ratio. In addition the description is given of a phase-shifter which utilises this form of magic-tee in conjunction with a circular polariser. The performance of an S-band model phase-shifter is commented upon, and it is shown that this device may be used to provide a variable mis-match. The systems described are shown to have valuable advantages over existing forms of rat-race, and phase-shifter when used in linear accelerator feed-back systems. Practical considerations are stressed throughout, since satisfactory experimental results are chiefly dependent on accuracy of construction and adjustments in setting-up. HD. 449. S. O. code no. 70-674-0-11. AERE G/R 612.

Drying of gases and determination of moisture in gases, a selected bibliography of literature references, by M. Greenhill. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1951. 6p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107972

U.D.C. no. 542.74. S. O. code no. 70-674-0-79. References taken from Chemical abstracts vol. 31-44, 1937-1950.
1. Gases - Dehydration - Bibliography - Gt. Brit. 2. Moisture - Determination - Bibliography - Gt. Brit. 3. AERE Inf/Bib 83.

Fundamental research in ferromagnetism. Final report under Contract no. N6onr-274, Task order II, NR018201 (Summary of research during the period Apr 1, 1947 through Mar 31, 1950), by T. L. Gilbert and S. Siegel. Armour Research Foundation, Chicago, Ill. Mar 1950. 79p drawing Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108004

Experimental investigations of subcritical (single domain) ferromagnetic particles were carried out. A theoretical investigation was made of the remagnetization of an initially saturated ferromagnet to resolve the paradoxical prediction of the semiclassical theory that a perfect ellipsoidal ferromagnetic crystal (with common axes of shape and crystal symmetry) saturated parallel to the major axis of symmetry will remain saturated until a counter field is applied which is sufficient to rotate the magnetization against the forces of anistropy. It is shown that the secular equation of a ferromagnet (using the Heitler-London-Heinsenberg model) can be rigorously expressed as a single difference equation analogous to a wave equation for reversed spins if it is required that the reversed spins obey Fermi statistics. Two methods were investigated for depositing individual ions or atoms with permanent magnetic moment on the surface of a ferromagnet in such a way that the domain boundaries would be outlined, deposition from a monoenergetic beam of ions and differential adsorption from a saturated vapor.

Investigation of non-metallic ferromagnetic substances. Progress report on NOL-4-Re9-22-2,

15 Sep 1948 to 1 Feb 1949, by L. R. Maxwell. U. S. Naval Ordnance Laboratory. Feb 1949. 8p photo Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108005

1. Ferromagnetic materials 2. Ferromagnetism - Research 3. Magnesia - X-ray inspection 4. Neutrons - Resonance levels.

Measurement of mean surface temperature by high frequency induction, by P. Fortescue and D. M. Harris. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1951. 12p diagr, graph, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 108089

HD 525. S. O. code no. 70-674-0-29.
1. Surfaces - Temperature - Measurement - Gt. Brit. 2. Induction, Electromagnetic - Gt. Brit. 3. Impedance - Measurement - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE E/R 720.

Photoemission from silver into AgCl, K Br, NaCl and new bands of photosensitivity in AgCl, by M. A. Gilleo. Massachusetts Institute of Technology. Laboratory for Insulation Research. Oct 1952. 42p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107953

The work required to move an electron from a metal into an insulator has been investigated photoelectrically. The work function thus found was about 4.3 ev for Ag evaporated in vacuo on KBr (Fowler plot) as well as on NaCl (threshold wavelength). The photoelectrons become trapped in these crystals at vacant anion sites and may be released by F-band illumination. For Ag on AgCl a work function of 1.1 ev is measured at the low temperatures used to freeze out ionic conductivity. In AgCl seven new bands of photoconductive response were found; the optical absorption was too small to be measured directly. These bands have a half width of ca. 0.2 ev at 90°K and are bleached by irradiation. The 4400, 5000, 5700, 6600, and 7500A bands increase in intensity with an increasing supply of electrons provided by photoelectric emission and behave analogously to the F bands of the alkali halides. The 4800 and 9200 A bands are favored by a scarcity of electrons and may correspond to trapped holes. Photosensitivity in all these bands can be created by irradiation in the intrinsic optical-absorption edge of AgCl at low temperature. They may not be characteristic of a perfect crystal. The intrinsic band-like photoconductive response of AgCl and the absorption edge on which it occurs shift toward shorter wavelengths with decreasing temperature. The maximum of response which appears with decreasing wavelength may arise from a bimolecular recombination of charge carriers released by light. The absorption edge steepens as it shifts toward shorter wavelengths with decreasing temperature. O.N.R. Contracts N5ori-07801 and N5ori-07858. MIT LIR TR 54.

Range-energy relations for Ilford nuclear emulsions, an A.E.R.E. report, by J. J. Wilkins. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1951. 39p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 107966

A discussion and review of range-energy relations for charged particles in the Ilford nuclear emulsions is presented. Some new measurements of low-energy alpha-particle ranges are reported, and are interpreted to show the appreciable influences of emulsion sensitivity and grain-size on short-track lengths. An experimental determination of the stopping powers of emulsions containing widely varying proportions of water (and heavy water) is described. The results, together with range-energy calibrations of Ilford emulsions already published by various workers, are correlated with "Webb-Cuer" stopping power calculations. The calculations are extended to estimate the stopping power of boron (sodium tetraborate)- loaded emulsions. Finally a collection of useful curves and tables is given, including emulsion composition tables, stopping power curves for emulsions of various compositions and range-energy relations for protons, alpha-particles and some heavier nuclei. S. O. code no. 70-674-0-73. HD 484. AERE G/R 664.

Shell model calculation of the photodisintegration of C^{12} into three alpha-particles, an A.E.R.E. report, by M. J. Brinkworth and T.H.R. Skyrme. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1951. 15p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107974

The photodisintegration of C^{12} into three α-particles is calculated on the assumption of a direct transition to the 2.9 MeV level of Be^8 with spin 2. Shell model wave functions are used. Agreement with experiment is not obtained, but it would appear that the observed photodisintegration can be explained at least as well by an independent particle model as by an α-particle model. S. O. code no. 70-674-0-85. AERE T/R 802.

Symposium on the handling of radioactive toxic substances held in two sessions on Sep 10-11th and Sep 13-14th 1951 at Buckland House, near Faringdon, Berkshire, an A.E.R.E. report edited by G. R. Hall. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 72p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.85. PB 107964

S. O. code no. 70-674-0-75. Contents: I. Introduction, by R. Hurst, Chairman. - II. Use of glove boxes. (a) Design of glove boxes by R. Hurst. - (b) Glove box design with double wall protection, by J. G. Ball. - (c) Requirements of filters for use with glove boxes, by W. G. Busbridge. - (d) Discussion. - II. Remote control of chemical operations. (a) Methods employed in the handling of radioactive materials, by J. Dean and A. B. Ritchie. - (b) An α, β, γ shielded box, by G. B. Cook. - (c) Pipettes for use in radio-chemistry, G. N. Walton.

(d) Remote pipetting and dilution, by G. Wortley. - (e) Chemical manipulation of β and γ active materials in bulky solution, by W. J. Arrol. - (f) Discussion. - IV. Housekeeping and decontamination. (a) Laboratory housekeeping, by C. L. Miles. - (b) Discussion. - V. General summing up, by the Chairman. - VI. List of those attending the symposium. - Appendix: Recommended painting systems for use in active areas. AERE C/R 958.

Vacuum technique for beginners, an A.E.R.E. report, by A. H. Turnbull. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Aug 1951. 57p drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.80. PB 107792

HD 541. S. O. code no. 70-674-0-37.
1. Vacuum systems, Dynamic - Theory - Gt. Brit. 2. Vacuum pumps - Gt. Brit. 3. Pumps, Rotary - Gt. Brit. 4. Vacuum seals - Gt. Brit. 5. Vacuum gages - Gt. Brit. 6. Gas flow - Theory - Gt. Brit. 7. Atomic power - Research - Gt. Brit. 8. AERE G/R 752.

PSYCHOLOGY

Studies in air crew composition. Study no. 2: Use of the Rotter incomplete sentences blank in the prediction of air crew adjustment, part I, prepared by Personnel Research Board, Ohio State University. U. S. Air Force. Human Resources Research Laboratories, Bolling Air Force Base, Washington, D. C. Jun 1952. 27p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107897

1. Personnel, Flying - Psychological records 2. Psychological tests - Equipment 3. Rotter incomplete sentences blank 4. Incomplete sentences blank 5. AAF HRRL MR 24.

Transfer of training in motor learning as a function of degree of first-task learning and inter-task similarity, by Carl P. Duncan and Benton J. Underwood. Northwestern University, Evanston Ill. Apr 1952. 43p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108129

Transfer between a first and a second task, both available on the same piece of equipment, was studied as a function of degree of learning of the first task and of degree of similarity between tasks. There were four degrees of first-task learning, defined by the number of practice trials, and three degrees of inter-task similarity, defined by the number of stimuli and responses newly paired on the second task. Contract no. AF33-(038)-11396. AAF WADC TR 52-64.

RUBBER AND RUBBER PRODUCTS

Development and formulation of low temperature polyisobutylene (butyl) rubber compounds. Interchemical Corporation. Research Laboratories, New York, N. Y. Final report, Jan 1, 1948-Feb 28, 1951, under Contract no. W36-039-sc-35580, by L. J. Radi and N. G. Britt. Mar 1951. 61p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108115

A project to develop a rubber-like compound possessing, as nearly as possible, the properties of the ideal compound as set up by the Signal Corps is discussed. The uses to which such a compound could be put extend to such applications as electrical insulation, shock mounts, aircraft parts, switch plate covers, fabric coatings, door gaskets, grommets, etc. Preparation and inspection of conventional formulations indicated that all the desired qualities were attainable except heat stability at 200°C and hardness at -55°C. The means by which these goals were approached and to what degree they were achieved is summarized. Project no. 1210. Dept. of the Army project 3-93-00-500. Signal Corps project 2005. For 4th report see PB 108115.

STRUCTURAL ENGINEERING

Building. Report of a visit to the U. S. A. in 1949 of a productivity team representing the building industry. Anglo-American Council on Productivity. May 1950. 112p photos, map, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.65. PB 106437

1. Construction industry 2. Housing - Design.

Characteristics of short radius tube bends, by T. E. Pardue, P. S. Symonds and H. A. Jarrell. U. S. Naval Research Laboratory. Oct 1946. 214p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $7.75, Photostat $27.50. PB 107850

The stress and flexibility factors for long radius tube turns are well established theoretically and experimentally for both in-plane and transverse bending. The solution of these factors to a sufficient degree of accuracy for the case of short turn tubes is a problem of considerable difficulty. They are very greatly affected by the length of the bend and by the presence of flanges or other stiff constraints near the ends of the bend. The flexibility and stress factors are direct results of the deformation of the pipe cross-section. If this deformation is constrained, different factors may be required for: (1) each type of load applied to the bend; (2) each component of displacement or rotation considered; (3) each length of bend; and (4) each type of constraint near the ends of a bend. The theoretical solution of the short turn tube problem neglecting the effects of end constraints has been worked out by Symonds.

These results are in reasonable agreement with experimental results for 180° bends. It does not appear practical to press these theoretical studies much further at this time. The work included in this report represents a major part of the experimental work required for a solution of this problem for all of the above four cases. NRL O 2963.

Comparative performances of a warm-air ceiling panel system and a convection system, by Robert W. Roose, Morris E. Childs, George H. Green and Seichi Kenzo. Illinois. Engineering Experiment Station, Urbana, Ill. Jun 1952. 92p photos, drawings, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $.80. PB 107872

Report of an investigation conducted by the Engineering Experiment Station, University of Illinois in cooperation with the National Warm Air Heating and Air Conditioning Association. University of Illinois Bulletin, Volume 49, Number 76, June 1952. University of Illinois Engineering Experiment Station, Bulletin series no. 401.
1. Heating - Panel system 2. Heating - Convection systems 3. Heating equipment, Domestic 4. Houses - Heating - Research 5. ILU EES B 401.

Design of nailed structures, by E. George Stern and Paul W. Stoneburner. Virginia. Engineering Experiment Station, Blacksburg, Va. Sep 1952. 69p photos, drawings, graphs, tables Available from Virginia Engineering Experiment Station, Virginia Polytechnic Institute, Blacksburg, Va. $.75. PB 107803

Most of part I was published in Civil Engineering and Public Works Review (London) Jan-Mar 1952. Part II was published in Agricultural Engineering Aug 1952. Bulletin of the Virginia Polytechnic Institute vol. 45, no. 6.
1. Joints, Nailed 2. Nails 3. VEES 81.

Dynamic response of thin beams to air blast, by Robert G. Locklin and Shirley N. Mills, Jr. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Sep 1951. 38p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108262

This paper presents a comparison of the theoretically predicted and observed elastic responses of thin simply-supported beams and of cantilever beams to air blast loading. The theoretical responses are predicted from the linear "small-deflection" beam theory and compared to motions observed with a high speed motion picture camera. The agreement of observed deflections with predicted ones is adequate for the thicker beams where the deflections were small, but inadequate for the thinner beams where the deflections were large. Project no. TB3-0112J of the Research and Development Division, Ordnance Corps. APG BRL R787.

Experimental investigation of protection achieved by sweat cooling on porous surfaces adjacent to non-porous surfaces, by E. Duncombe. Canada. National Aeronautical Establishment. 1952. 30p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available for exchange from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 107890

Published in Jan 1951 as report MT-20 of the Division of Mechanical Engineering.
1. Cooling, Surface - Canada 2. Cooling systems - Canada 3. Heat - Transmission - Walls - Canada 4. NAEC R16.

Investigation on connectors for use on demountable military buildings, by John L. Harrington and F. R. O'Brien. Southern Research Institute, Birmingham, Ala. Sep 1951. 91p photos, diagrs, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 107967

A survey with an engineering evaluation is presented of connector systems. The purpose of the survey was to determine the suitability of known connectors and fastenings for use on demountable panels and prefabricated structural elements of demountable military buildings. A detailed analysis of the requirements and principles used in the evaluating system and a description of the factors necessary for arrival at a final score for each connector are given. Drawings of connectors are included. Summary evaluation charts show the final scoring. 1107-326-I.

Personnel heating devices. Armour Research Foundation, Chicago, Ill. Under contract no. DA-44-109-qm-1154. ARF Proj 90-1279L.

Report no. 1 for period Jul 15-Aug 31, 1952, by R. R. Shaw. Sep 1952. 29p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107869

This report gives the design objectives, outlines and fields of investigation in which the main efforts will be divided, and reviews the progress which has been made to date.

Report no. 2 Sep 1-Sep 31, 1952, by H. E. Robison and I. B. Fieldhouse. Oct 1952. 5p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107892

Report of the Working Party on Small Diameter Water Pipes. Gt. Brit. Ministry of Housing and Local Government. 1952. 15p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 108044

1. Water pipe lines - Construction - Gt. Brit. 2. Pipe lines - Installation - Gt. Brit. 3. Pipe - Insulation - Gt. Brit. 4. Pipe - Standards - Gt. Brit. 5. Farms - Equipment - Gt. Brit. 6. Gt. Brit. Working Party on Small Diameter Water Pipes.

Stilling basins. Report by David Navon for CE252 design of irrigation structures. Colorado Agricultural and Mechanical College, Fort Collins, Colo. Dec 1951. 42p drawings, graphs Available from Civil Engineering Dept., Colorado A and M College, Fort Collins, Colo. PB 107923

1. Hydraulic engineering 2. Irrigation - Structures - Design 3. Flow, Hydrodynamic - Energy dissipation

Study of the practical efficiency under static loading of riveted joints connecting plates, by Wilbur M. Wilson, William H. Munse and M. A. Cayci. Illinois. Engineering Experiment Station, Urbana, Ill. Jul 1952. 75p photos, diagrs, drawings, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $.75. PB 107873

Report of an investigation conducted by the Engineering Experiment Station, University of Illinois, in cooperation with the Research Council on Riveted and Bolted Structural Joints (Project II). University of Illinois Bulletin, Volume 49, Number 78, July, 1952. University of Illinois Engineering Experiment Station, Bulletin series no. 402.
1. Joints, Structural - Static strength 2. Joints, Riveted - Tests 3. Plates - Stresses 4. Research Council on Riveted and Bolted Structural Joints 5. ILU EES B 402.

Survey of the behaviour in use of asbestos-cement pressure pipes, by F. E. Jones and J. P. Latham. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Mar 1952. 48p photos, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108045

S. O. code no. 47-550-15. Appendix: Examination of samples of asbestos-cement pressure pipes after use, by F. E. Jones and R.D.J. Tarleton.
1. Pipe - Insulation - Gt. Brit. 2. Pipe lines - Installation - Gt. Brit. 3. Pipe, Asbestos-cement insulated - Strength - Gt. Brit. 4. Pipe, Asbestos-cement insulated - Corrosion prevention - Gt. Brit. 5. Cements, Asbestos - Uses - Gt. Brit. 6. Water pipe lines - Pressure measurement - Gt. Brit. 7. DSIR NB SR 15.

Wave protection aspects of harbor design, a manual of principles and procedures prepared by the staff of the Hydraulic Structures Laboratory, Azusa, California. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Aug 1952. 104p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108098

John H. Carr, Project Engineer. Report no. E-11. Contract NOy-12561.
1. Harbor protection systems 2. Harbors - Design 3. Breakwaters 4. Waves, Ocean - Diffraction.

TEXTILES AND TEXTILE PRODUCTS

Cotton spinning. Report of a visit to the U.S.A. in 1949 of a productivity team representing the cotton spinning industry. Anglo-American Council on Productivity. Mar 1950. 133p photos, map, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 106438

1. Cotton - Spinning 2. Spinning machines.

Cotton yarn doubling. Report of a visit to the U.S.A. in 1949 of a productivity team representing the cotton yarn doubling industry. Anglo-American Council on Productivity. May 1950. 104p photos, map, drawings, tables Available from Office of Technical Services, U. S. Dept., of Commerce, Washington 25, D. C. $.75. PB 106440

1. Cotton yarn 2. Cotton industry 3. Yarn - Manufacture.

Rayon weaving. Report of a visit to the U.S.A. in 1949 of a productivity team representing the rayon weaving industry. Anglo-American Council on Productivity. Dec 1949. 72p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 106450

1. Rayon - Weaving.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Analysis of the errors in curve-fitting problems with an application to the calculation of stability parameters from flight data, by Marvin Shinbrot. U. S. National Advisory Committee for Aeronautics. Nov 1952. 29p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D.C. PB 107932

1. Stability, Dynamic - Tests 2. Curve fitting 3. Parameters, Stability 4. Mathematical equations and solutions 5. U. S. Ames Aeronautical Laboratory, Moffett Field, Calif. 6. NACA TN 2820.

Dynamic landing loads of flying boats with special reference to measurements made on Sunderland TX.293, by Anne Burns and A. J. Fairclough. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1948. 38p photos, drawing, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.25. PB 107915

An account is given of a full-scale investigation into the stresses occurring in the wing members of a Sunderland flying boat during landing impacts. It is found that the main dynamic effect is caused by the wing oscillating in its fundamental mode. These dynamic loads have a spanwise distribution similar to the normal lift load and, if the level flight lift load is taken as unity, a magnitude (in the most severe impact recorded) of 1.4 upwards and 1.5 downwards. Generalizing this result, one concludes that whereas down loads in landing may be a deciding factor in design the up loads are amply covered by existing requirements. Comparison of calculated and experimental loads found in these tests indicates that satisfactory agreement can be attained by using recently introduced modifications of standard dynamical methods. Although the investigation is primarily a structural one some interesting results on general water load phenomena are obtained. Cover date is 1952. S. O. code no. 23-2629. Contents: - Appendix I: Two methods of obtaining the centre of gravity acceleration from the records of accelerometers in the wings and hull. - Appendix II: Variation of flying-boat attitude and height measured during the Sunderland landings. - Appendix III: Methods of measuring rate of descent, ground speed and attitude of aircraft during landing: - Appendix IV: An estimate of the effect of flying boat size on the landing impact curve. ARC RM 2629.

Experiments on transonic flow around wedges, by George P. Wood. U. S. National Advisory Committee for Aeronautics. Nov 1952. 34p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108031

1. Mach number - Effect 2. Wing profiles - Pressure distribution 3. Wings - Boundary layer 4. Flow, Mixed - Theory 5. Flow, Laminar - Theory 6. Flow, Turbulant - Theory 7. Boundary layer, Laminar - Flow 8. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 9. NACA TN 2829.

Flight tests on Hurricane II, Z.3687 fitted with special wings of "low-drag" design, by R. H. Plascott, D. J. Higton, F. Smith and A. R. Bramwell. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1946. 13p drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108058

Cover date is 1952. S. O. code no. 23-2546.
1. Wing profiles - Tests - Gt. Brit. 2. Drag, Profile - Measurements - Gt. Brit. 3. Reynolds number - Effect - Gt. Brit. 4. Airfoils, Low drag - Aerodynamics - Gt. Brit. 5. Hurricane II, Z.3687 (Airplane) - Gt. Brit. 6. Airplanes - Flight tests - Gt. Brit. 7. ARC RM 2546.

Flow through a helicopter rotor in vertical descent, by P. Brotherhood. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jul 1949. 14p photos, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107916

Flight tests have been made on a Hoverfly I helicopter to investigate the types of flow associated with various rates of vertical descent. At the same time measurements of the performance were made. The results are analysed by two different methods to produce characteristic curves for the rotor and are compared with data obtained from wind tunnel tests on model propellers at negative rates of advance. The information was obtained from the Hoverfly I helicopter but it is thought that the results can be applied to any other helicopter of similar size. Cover date is 1952. S. O. code no. 23-2735. ARC RM 2735.

Influence of the method of stringer attachment on the buckling and failure of skin panels with square top-hat stringers, an abstract from the thesis of E. E. Labram prepared by K. H. Griffin. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1952. 8p diagrs, graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108086

S. O. code no. 23-9006-93.
1. Stiffeners, Longitudinal - Stress distribution - Gt. Brit. 2. Panels, Stiffened - Stresses - Gt. Brit. 3. Panels - Buckling - Gt. Brit. 4. College of Aeronautics, Cranfield, Eng. Dept. of Aircraft Design 5. ARC CP 93.

Langley full-scale-tunnel investigation of the maximum-lift and stalling characteristics of a trapezoidal wing of aspect ratio 4 with circular-arc airfoil sections, by Roy H. Lange. U. S. National Advisory Committee for Aeronautics. Nov 1952. 24p photos, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107996

1. Wings, Trapezoidal - Wind tunnel tests 2. Wings, Trapezoidal - Lift 3. Wings, Trapezoidal - Stalling 4. Wings, Trapezoidal - Aspect ratio 5. Mach number - Effect 6. Reynolds number - Effect 7. Stability, Longitudinal - Static tests 8. Wing profiles - Wind tunnel tests 9. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 10. Airfoils, Circular-arc - Aspect ratio 11. NACA TN 2823.

Note on the influence of aspect ratio on the variation with Mach number of the lift and hinge-moment characteristics of a wing and full-span control, by A. D. Young and P. R. Owen. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1943. 6p graph, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N.Y. $.50. PB 108065

It is shown on the basis of the linearised theory that the effects of compressibility on the lift and hinge-

moment characteristics of a wing and full-span control are functions of aspect ratio. With reduction in aspect ratio the increase of the lift characteristics with Mach number is reduced appreciably. The same effect is noted for the hinge-moment characteristic b_1. The effects on the hinge-moment characteristics b_2 and b_3 are rather more complicated, but in many practical cases the influence of aspect ratio will be very small. Cover date is 1952. S. O. code no. 23-2767. ARC RM 2767.

Note on the maintenance of laminar-flow wings, by W. E. Gray and H. Davies. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1947. 3p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 108055

Cover date is 1952. S. O. code no. 23-2485.
1. Airplanes - Flight tests - Gt. Brit. 2. Hurricane (Airplane) - Gt. Brit. 3. King Cobra (Airplane) - Gt. Brit. 4. Flow, Laminar - Theory - Gt. Brit. 5. ARC RM 2485.

Series of low-drag aerofoils embodying a new camber-line, by Ola Douglas. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1947. 19p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108056

Cover date is 1952. S. O. code no. 23-2494.
1. Airfoils, Low drag - Aerodynamics - Gt. Brit. 2. Airfoils, Low drag - Design - Gt. Brit. 3. Camber, Aerodynamic - Gt. Brit. 4. ARC RM 2494.

Some measurements at low supersonic speeds by a method for continuous variation of the Mach number, by G. Drougge. Flygtekniska Försöksanstalten (FFA), Stockholm. 1952. 17p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108141

A previous described method (ref. 1) for continuous variation of the Mach number in a supersonic nozzle by means of a movable plate is further developed. The plate is used as a holder for a three-component balance for half-models. The test section and the movable plate arrangement are described in detail and also are given the results of the calibration of the test section. Finally some results from three-component measurements on some wings of simple plan forms are presented. The Mach number range obtained is M = 1.07 - 1.40. FFA no. 42.

Instruments

Measurements of temperature variations in the atmosphere near the tropopause with reference to airspeed calibration by the temperature method, by Lindsay J. Lina and Harry H. Ricker, Jr. U. S. National Advisory Committee for Aeronautics. Oct 1952. 23p photos, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington, 25, D. C. PB 107708

1. Troposphere 2. Atmosphere - Temperature - Measurements 3. Instruments, Aeronautical 4. Instruments, Meteorological 5. Mach number - Effect 6. Calibration, Airspeed 7. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 8. NACA TN 2807.

Preliminary study of learning in the B-50D flight simulator, by Ruth A. Dinsmore and Philip H. DuBois. U. S. Air Force. Human Resources Research Laboratories, Bolling Air Force Base, Washington, D. C. Jul 1952. 22p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108073

1. B-50D (Flight simulator) 2. Simulators, Flight 3. Personnel, Flying - Training 4. AAF HRRL MR 26.

Red-green filters for simulated instrument flying, by Mathew R. Wilson. U. S. Air Force. School of Aviation Medicine, Randolph Field, Tex. Dec 1952. 8p photo, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108323

Air Force pilots are required to fly a specified number of hours under instrument flight conditions. Because some pilots have primary duties other than flying, instrument flight must be simulated in some way. This can be done by using a red and green two-stage color filter which limits the pilot's vision to the interior of the aircraft and allows the copilot to see both inside and outside the aircraft. The red-green filters provide a more satisfactory system for simulating instrument flying than the currently accepted blue-amber system. Aircraft instrument dials and standard Armed Forces Visual Acuity Charts are much easier to read through red plastic than through blue plastic. The green and amber plastics are comparable in transmission qualities. AAF SAM Proj 21-1207-0003.

Engines and Propellers

Comparison of helicopter rotor model tests of aerodynamic damping with theoretical estimates, by G. J. Sissingh. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1951. 16p diagr, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108088

Cover date is 1952. S. O. code no. 23-9006-98. Technical note Aero 2118.
1. Helicopters - Rotors - Damping - Tests - Gt. Brit. 2. Helicopters - Rotors - Damping - Theory - Gt. Brit. 3. ARC CP 98.

Theoretical and experimental investigation of the influence of temperature gradients on the deformation and burst speeds of rotating disks, by P. L. Willerdink, A. G. Holms and S. S. Manson. U. S. National Advisory Committee for Aeronautics. Oct 1952. 45p drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107707

1. Disks - Stresses 2. Disks - Temperature variations 3. Compressors - Stresses 4. Turbines - Stresses 5. Materials, Aircraft - Tensile properties 6. Materials, Aircraft - Plasticity 7. Loads, Axial 8. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 9. NACA TN 2803.

Aerodynamics

Calculation of aerodynamic derivative coefficients for wings of any plan form in non-uniform motion, by W. P. Jones. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1946. 12p diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108054

Cover date is 1952. S. O. code no. 23-2470. Contents: - Appendix I: Calculation of W_e due to a doublet strip of strength $s_1 e^{-\gamma x/v}$. - Appendix II: Summary of computational scheme.
1. Mathematics, Applied - Aerodynamics - Gt. Brit. 2. Wings - Aerodynamics - Gt. Brit. 3. Wings - Downwash - Gt. Brit. 4. Wings - Pressure distribution - Gt. Brit. 5. Wings - Aspect ratio - Gt. Brit. 6. Airfoils - Damping coefficients - Gt. Brit. 7. ARC RM 2470.

Effects of independent variations of Mach number and Reynolds number on the maximum lift coefficients of four NACA 6-series airfoils sections, by Stanley F. Racisz. U. S. National Advisory Committee for Aeronautics. Nov 1952. 32p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107997

1. Camber, Aerodynamic 2. Airfoils - Wind tunnel tests 3. Airfoils - Lift coefficient 4. Wings - Thickness 5. Wings - Surface distortion 6. Wing profiles - Wind tunnel tests 7. NACA 6 series (airfoils) 8. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 9. NACA TN 2824.

Electric tank for the determination of theoretical velocity distributions, by T. J. Hargest. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1949. 9p photo, drawings, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108062

An analogy due to Relf has been applied to the design of apparatus for quickly determining the theoretical velocity distributions around an aerofoil in cascade. The accuracy of the apparatus was tested by determining the velocity distribution around a cylinder. An accuracy of within 1 per cent of the approach velocity was obtained for this case. The apparatus has since been applied to determine the theoretical velocity distribution around various aerofoils in cascades; an example is given of the pressure distribution around an aerofoil at zero incidence. An application to determine the theoretical velocity distribution around the central aerofoil of a nozzle cascade where the effect of the ducting side walls is included, is also given. Cover date is 1952. S. O. code no. 23-2699. ARC RM 2699.

Experimental study of the effects of finite surface disturbances and angle of attack on the laminar boundary layer on an NACA 64A010 airfoil with aera suction, by Milton A. Schwartzberg and Albert L. Braslow. U. S. National Advisory Committee for Aeronautics. Oct 1952. 35p photo, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107705

1. Airfoils - Wind tunnel tests 2. NACA 64A010 (Airfoil) 3. Flow, Laminar 4. Wings - Angle of attack 5. Wings - Boundary layer 6. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 7. NACA TN 2796.

Improper integrals in theoretical aerodynamics, by K. W. Mangler. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1951. 36p diagr Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.00. PB 108087

Cover date is 1952. S. O. code no. 23-9006-94. Report no. Aero 2424.
1. Equations, Integral - Gt. Brit. 2. Aerodynamics - Theory - Gt. Brit. 3. ARC CP 94.

Theoretical investigation of the effect of partial wing lift on hydrodynamic landing characteristics of V-bottom seaplanes in step impacts, by Joseph L. Sims and Emanuel Schnitzer. U. S. National Advisory Committee for Aeronautics. Nov 1952. 20p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107931

1. Seaplanes - Hydrodynamics 2. Seaplanes - Landing shock 3. Loads, Landing - Impact 4. Seaplanes - Hulls, V-bottom - Impact pressures 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 2815.

Land Transportation

Progress reports of investigation of railroad rails and joint bars, by Ralph E. Cramer and Russell S. Jensen. Illinois. Engineering Experiment Station, Urbana, Ill. Aug 1952. 88p photos, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $.30. PB 107870

Progress report of an investigation conducted by the Engineering Experiment Station, University of Illinois, in cooperation with the Association of American Railroads and the American Iron and Steel Institute. (Reprinted from Proceedings of American Railway Engineering Association, Vol. 50, 1952). University of Illinois Bulletin, Volume 50, Number 5, August 1952. University of Illinois Engineering Experiment Station, Reprint Series no. 49. Contents: Investigation of failures in railroad rails, by Ralph E. Cramer. - Tenth progress report of the rolling-load tests of joint bars, by Russell S. Jensen. - Tenth progress report of the shelly rail studies at the University of Illinois, by Ralph E. Cramer.
1. Rails - Fracture 2. Rails - Joint bars - Rolling load tests 3. ILU EES R 49.

Steam driven road vehicles planned by firm Fried. Krupp. British Intelligence Objectives Subcommittee. May 1943-Oct 1946. 55f photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Enlargement Print $8.75.
PB 107942

Contents: Steam driven road vehicles planned by the firm Fried. Krupp, by Dr. Wittig. Oct 1946. - Versuche an einem kohlegefeuerten dampflastwagen (Tests of a coal-burning steam tractor) by Gerhard Riggeberg (From ATZ Automobiltechnische Zeitschrift jahrg. 46, nr. 9/10, 25 Mai 1943, p. 209-218. - Entwicklungsmöglichkeiten des dampfkraftwagens (Possibilities of developing steam driven tractors) by M. Hubmeier (From ATZ Automobiltechnische Zeitschrift jahrg. 46, hft. 15/16, p. 351-360. 25 Aug 1943). - Das dampfbetriebene, schienlose fahrzeug als devisensparer (Steam-driven vehicles without rails as an economy) by Herr Giesing (From ATZ Automobiltechnische Zeitschrift jahrg. 46, no. 15/16 p. 569-575. - Dampfwagen (Locomotive) by R. Engel and K. Tratsorsky. (ATZ Automobiltechnische Zeitschrift jahrg. 46, nr. 21/22, p. 306-308, Nov 1943.) - Dampfanbetrieb für strassenfahrzeuge (Steam drive for road vehicles) by R. Roosen (Reprinted from Henschel-hefte,4. kraftwagen-sondernummer Feb 1935). - Working expenses of motor trucks of various types and sizes.
1. Vehicles, Steam driven - Germany 2. Tractors, Steam driven - Germany 3. Trucks - Operating costs - Germany 4. BIOS DOCS/2651/1655/1 5. BIOS DOCS/2651/1655/2 6. Micro BIOS FD 998/48, Frames 1-55.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

Investigation of the spontaneous freezing point of small quantities of water, by Charles L. Hosler and C. Robert Hosler. Pennsylvania State College. Mineral Industries Experiment Station. Div. of Meteorology. Scientific report no. 1 under Contract no. AF19(604)-140. Aug 1952. 50p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108100

MISCELLANEOUS

Catalog of OSRD reports, Division 8: Explosives (unclassified reports) compiled and edited by Sylvia E. Weiss and Herbert S. White. U. S. Library of Congress. Technical Information Division. Nov 1952. 27p Available from Office of Technical Services, U. S. Dept., of Commerce, Washington 25, D. C. Mimeo: $.50. PB 104375s9

Handbook on air cleaning: Particulate removal, prepared by Sheldon K. Friedlander, Leslie Silverman Philip Drinker and Melvin W. First. Harvard University. Air Cleaning Laboratory. Sep 1952. 92p photos, drawings, diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.45. PB 107739

1. Air - Purification 2. Air conditioning - Equipment 3. Aerosols - Filtration 4. Aerosols, Radioactive - Filtration 5. Filters, Air 6. Dust removal 7. Dust removal equipment 8. Particles, Charged - Collectors 9. Atomic power - Research 10. Dust, Radioactive - Monitors 11. U. S. Atomic Energy Commission.

Industrial instrumentation for the process industries. Papers from the third annual short course in industrial instrumentation, Oct 8, 9 and 10, 1951. Sponsored by the Department of Chemical Engineering. Florida. Engineering and Industrial Experiment Station, Gainesville, Fla. Aug 1952. 35p photos, drawings, diagrs, graphs Available from The Director, Florida Engineering and Industrial Experiment Station, Gainesville, Fla.
PB 107642

Bulletin series no. 55. Engineering progress at the University of Florida, Vol. VI, no. 8, August 1952. Contents: Industrial pH measurement and control, by Earle W. Prendergast. - Combustion safeguards, by S. W. Johnson. - Introduction to flow rate measurement, by G. M. Heslin. - Citrus concentrate plant instrumentation, by Harold L. Shaw. - Process control in the phosphate industry, by Robert H. Berg. - Instruments demonstration sessions.
1. Industrial research 2. Process industries 3. Instruments, Industrial - Design 4. Combustion - Prevention 5. Flow - Measurements 6. Citrus fruit - Concentrates - Plant instrumentation 7. Phosphate industry 8. F EES B 55.

Management accounting. Report of a specialist team which visited the U.S.A. in 1950. Anglo-American Council on Productivity. Nov 1950. 74p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50.
PB 106445

1. Accounting - Methods 2. Industrial management.

Productivity measurement in British industry. A symposium of papers by authors with first-hand experience of its benefits. Anglo-American Council on Productivity. Nov 1950. 49p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 106449

1. Efficiency, Industrial - Gt. Brit.

Recent developments and techniques in the maintenance of standards. Proceedings of a symposium held at the National Physical Laboratory on 21st and 22d May 1951. Gt. Brit. National Physical Laboratory. 1952. 113p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 107903

S. O. code no. 48-123. Contents: I. Primary load standards: Calibration of load measuring devices, by Bruce L. Wilson. - Primary load standard, by F. Aughtie. - II. Standard of length: Present state of a light-wave standard of length, by E. Engelhard. - Interferometry of length, by H. Barrell. - III. Standards of radioactive isotopes: Maintenance of radioactive standards with the 4π proportional counter, by R. C. Hawkings, W. F. Merritt, and J. H. Craven. - Standardization of radioactive isotopes by coincidence and γ-ray ionization methods, by W. E. Perry. - IV. Temperature: Extension of the international temperature scale below the oxygen point, by H. van Dijk. - Improvements in the realization of the international temperature scale over the range 182.97° C to 630.5° C, by C. R. Barber. - V. Standard of light: Establishment of the photometric scale at the National Physical Laboratory, by J.W.T. Walsh. - Co-ordination of the photometric units at the Bureau International des Poids et Mesures, by J. Terrien. - VI. Standards of frequency: On the precision of optical methods for the determination of the velocity of light, by Erik Bergstrand. - Measurement of time, frequency, and velocity, by L. Essen.
1. Standards - Congresses 2. Atomic power - Research 3. Radioisotopes - Standards 4. Loads - Measuring devices - Calibration 5. Loads, Structural - Standards 6. Length - Standards 7. Radiation counters - Standards 8. Temperature - Measurements - Standards 9. Light - Measurements - Standards 10. Light - Velocity - Measurements - Standards 11. Time - Measurements - Standards.

Report of the Fire Research Board with the report of the Director of Fire Research for the year 1951. Gt. Brit. Fire Research Board. Jan 1952. 55p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 107908

S. O. code no. 47-151-0-51.
1. Fire protection - Research - Gt. Brit. 2. Combustion - Research - Gt. Brit.

Scientific manpower bibliography (supply, demand and utilization) 1950-1951, prepared by the Technical Library Branch. U. S. Research and Development Board. May 1952. 40p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111073

Supplement to PB 111073. RDB 114/26, supplement to RDB 303/8.
1. RDB 303/8 supplement 2. RDB 114/26.

Scientific manpower (supply, demand and utilization) 1940-1950, a selected and annotated bibliography, prepared by Library Section, Information Branch. U. S. Research and Development Board. Jan 1951. 28p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111073

1. Scientists - Bibliography 2. Labor supply - Bibliography 3. Technical research - Bibliography 4. RDB 303/8.

Simplification in industry. Report of an investigation in the U. S. A. made by a group appointed by the Council. Anglo-American Council on Productivity. Oct 1949. 15p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.30. PB 106452

German edition is PB 104615.
1. Industry - Organization control, etc.

Statistical manual, methods of making experimental inferences, by C. W. Churchman. Second revised edition. U. S. Frankford Arsenal, Philadelphia, Pa. Pitman Dunn Laboratory. Jun 1951. 221p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $3.50. PB 111058

For earlier edition see PB 58213. Manual prepared under Contract W20-018-ORD-13073 with Wayne Engineering Research Institute, Wayne University, Detroit, Mich.
1. Statistical methods 2. Inferences, Experimental 3. Sequential analysis.

Strontium-90 as a replacement for radium in deck and personnel markers, by G. T. Hicks, E. B. Beggs, and L. H. Dawson. U. S. Naval Research Laboratory. Sep 1952. 13p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111068

During a 1-1/2-year study on the luminous characteristics of radioactive deck and personnel markers activated by the isotope strontium-90, it was determined that little deterioration in the properties of the phosphor took place. In practically all markers designed for service use, no deterioration could be detected. The development of strontium-90 is a decided advance in the production of aids to night military operations. NRL R 4035.